

# The Refrigeration Service Engineer

VOL. 13 NO. 12

★ ★ ★

DECEMBER . 1945

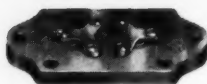


NEW REFRIGERATORS GOING TO DEALERS •

REFRIGERANT PHYSICAL PROPERTIES •

FUTURE OF REFRIGERATION SERVICE •

**"YES, SIR, when you put a  
CHICAGO SEAL on a bent or  
scored shaft, you get a nice  
profit and your customer gets  
a factory-perfect job."**



#### CHICAGO VALVE PLATES

Save time and work, too.  
Only refrigerator compressor  
valve plates with removable  
valve seats. Sizes for most  
compressors.



#### CHICAGO GENERAL REPLACEMENT SEALS

Go on refrigerator compressors  
in less time, with less work,  
and cut down "call backs."



SOLD BY  JOBBERS

# CHICAGO SEAL CO.

20 NORTH WACKER DRIVE • CHICAGO 6, ILL.

THE REFRIGERATION SERVICE ENGINEER. Nickerson & Collins Co., Publishers, 435 N. Waller Ave., Chicago, 44, Ill.  
Published monthly. Vol. 13, No. 12, December, 1945. Entered as second class matter March 4, 1938, Chicago, Ill., under  
the Act of March 3, 1879. Subscription in the United States, \$2.00 per year; all other countries, \$3.00 per year.

# KNOW YOUR REFRIGERANT CORROSION LIMITS

## EFFECTS OF MOISTURE

Moisture in a refrigerating system may cause any or all of the following:

1. Freezing up at expansion valve or capillary tube, ice in the evaporators.
2. Corrosion of metals to form sludge.
3. Copper Plating.

## RESULTS OF TESTS CONDUCTED ON STEEL

Refrigerant	% Water by Weight	Results
Sulfur Dioxide	0.03	Slight discoloration
	0.10	Slight scale
	0.15	Heavy scale Presence of air did not affect results
Methyl Chloride	0.02	Slight discoloration
	0.03	Marked discoloration
	0.05	Very slight scale Moderate to heavy scale Presence of air increased corrosion in all cases
"Freon-12"		Similar to methyl chloride

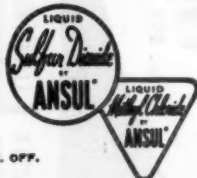
## FACTS REVEALED

1. Corrosion of metals occurs whenever the amount of water present exceeds fairly well defined limits.
2. Water reacts with sulfur dioxide, methyl chloride, "Freon-12" and other refrigerants to form acids.
3. These acids react with steel, copper, and aluminum parts of a refrigerating system to form definite metallic salts (sludges).
4. In a sulfur dioxide system the amount of moisture tolerable is higher than in a methyl chloride or "Freon-12" system but corrosion, once begun, proceeds more rapidly in a sulfur dioxide system.
5. Corrosion in a butane or isobutane system is due to the direct action of the water and perhaps air, on metals.
6. Moisture tolerances are higher for copper, brass and aluminum than for steel.
7. Moisture tolerances are lower at higher temperatures found in condenser and compressor than at room temperature.
8. Corrosion is much worse in the presence of air in all refrigerants except sulfur dioxide.
9. Approximately 90% of the sludges produced in refrigerating systems are due to moisture; the others are associated with oil and minor causes.



SEND FOR THIS FREE BOOK ON  
ANSUL REFRIGERANTS  
(3rd Edition)

You will find this and other equally interesting refrigerant subjects thoroughly and authoritatively covered in this reference manual.



\*REG. U.S. PAT. OFF.

FOR REFRIGERANTS—SEE YOUR ANSUL JOBBER

# ANSUL CHEMICAL COMPANY

MARINETTE, WISCONSIN

AGENTS FOR KINETIC'S "FREON-11," "FREON-12" AND "FREON-22"

# "DETROIT" *Automatic*

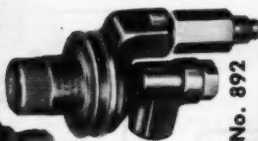
## EXPANSION VALVES

For long life and highest  
satisfaction in operation



**No. 672** "Detroit"  
Automatic Expansion  
Valve is standard  
makes it ideal for  
original equipment  
and replacement  
service.

No. 892 "Detroit"  
Automatic Expansion  
Valve is standard  
special brass body  
assures long life,  
freedom from corro-  
sion. Silver brazed  
joints prevent refri-  
gerant loss. Dia-  
phragms of special  
material render it  
reliable in service.  
Needles and seals  
are of Delubaloy-  
hard, corrosion re-  
sistant.



**No. 892**

**WRITE  
FOR YOUR COPY  
OF THIS  
SERVICE HELP**

This is the seventh of a  
series of service bulletins  
published by Detroit Lub-  
ricator Company. They  
are printed on 8 1/2" x 11"  
paper, punctured for a  
standard loose leaf  
binder. Copies may be  
had on request. Write for  
yours.

**DETROIT LUBRICATOR COMPANY** General Offices: 5900 TRUMBULL AVENUE  
DETROIT 8, MICHIGAN

Division of **AMERICAN RADIATOR & STANDARD SAFETY** CORPORATION

Canadian Representatives — RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG



"DL" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Return  
Accessories • "Detroit" Expansion Valves and Refrigeration Accessories • Stationary and Locomotive Lubricators



# DRYING AUTOMATIC EXPANSION VALVES

## No. 7 of a Series

### Method No. 2 Atmospheric Oven (4 hours)

Use any type oven, but temperature regulation is absolutely essential to avoid damaging the valve.

Dehydrate 4 hours at temperature of 220° F maximum. Install or cap as soon as valve has cooled to avoid entry of moisture from air. No. 672 Valve must be kept in an upright position.

Moisture in a refrigeration system may so permeate the valves that they may need to be dried separately.

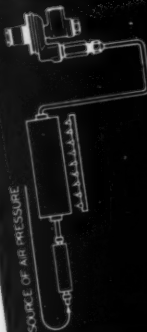
Detailed here are four effective methods of drying the valves—Automatic Expansion Valves—No. 672, 892 and 895.

When a No. 672 valve is heated it must be kept in an upright position so the dampening fluid inside the bellows shell will not escape. On No. 672 valves having a range of 0 to 50 psi, loosen adjusting spring completely. On No. 672 valves having a range of 25" vacuum to 25 psi, set adjusting screw at midpoint.

Always remove the adjusting screw cap or rubber breather cap before dehydrating.

No. 892 and 895 valves may be dehydrated in any position. Remove adjusting screw cap and rubber gasket, and loosen adjusting spring completely before dehydrating.

Space limitations prevent giving the full text of this service bulletin in this issue. The service bulletin is complete. Write for your copy.



### Method No. 3 Hot Dry Air (30 minutes)

Connect inlet of valve to source of hot dry air, under pressure (see sketch). Blow hot air (220° F maximum) into valve for 30 minutes. Cap or install valve at once.

TO VACUUM PUMP



CONVENIENCE AND EFFICIENCY RECOMMEND THIS HENRY CARTRIDGE DEHYDRATOR

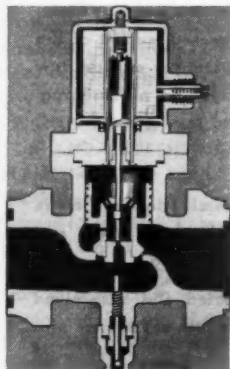
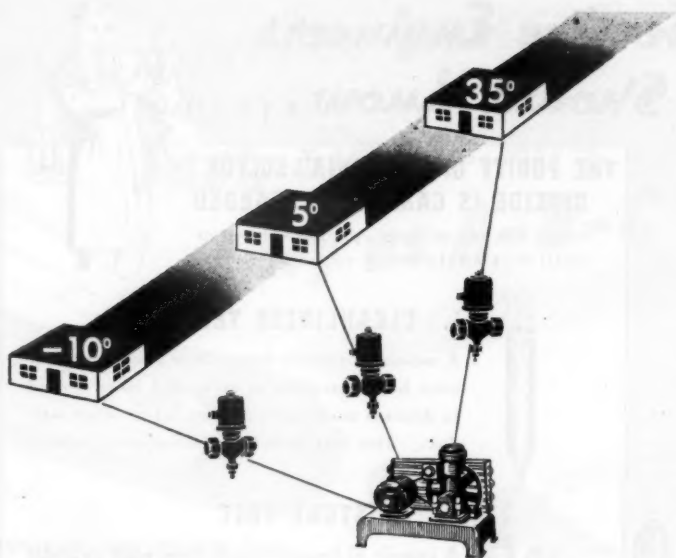
• Every trace of moisture can be removed from a Freon or Methyl Chloride refrigeration system and it can be kept moisture-free conveniently with this Henry Cartridge Dehydrator. The side outlet permits permanent installation of the dehydrator in a line. The flange shell construction affords easy replacement of cartridge. On new installations the dehydrant cartridge can be inserted AFTER the system has been

Ask Your Jobber For A Henry Type 756 or 757 Cartridge Dehydrator —  
He Has It Or Can Get It For You.

pressure tested for leaks. Henry design, however, provides more than just operating conveniences — it assures greater operating efficiency because of the patented dispersion tube, dehydrant compression spring and distortion-proof flange, illustrated and described above. Available in a wide range of sizes with refill cartridges—with either Activated Alumina or Silica Gel. Cartridges are packed in moisture-proof containers.

**HENRY VALVE COMPANY** 3260 WEST GRAND AVENUE, CHICAGO 51, ILLINOIS

PACKERS AND PACKED VALVES • STRAINERS • DRYERS FOR REFRIGERATION AND AIR CONDITIONING  
AMMONIA VALVES • FORGED STEEL VALVES AND FITTINGS FOR OIL, STEAM AND OTHER FLUIDS



**FOR  
MULTIPLE TEMPERATURE CONTROL  
ALCO SOLENOID VALVES**

*... Fully Automatic*

**W**hen you want to keep two or more rooms at different temperatures, instant-acting Alco Solenoid Valves are the answer.

They control the refrigerant flow automatically with "pin point" accuracy and are electrically actuated by the temperature of the space to be cooled.

This is just one of the many applications to assure automatic positive flow control. For complete details, send for our Solenoid Bulletin.



Designers and Manufacturers  
of Thermostatic Expansion  
Valves; Pressure Regulating  
Valves; Solenoid Valves;  
Float Valves; Float Switches.

**ALCO VALVE CO.**

857 KINGSLAND AVE. • ST. LOUIS 5, MO.

# Service Engineers Should Know...



## THE PURITY OF "VIRGINIA" SULFUR DIOXIDE IS CAREFULLY GUARDED

— the content of each cylinder — large or small — is analyzed 2 separate times.



### 1. CLEANLINESS TEST

A measured sample drawn from each container must be water-white in color and when boiled to dryness must leave no dirt, oil or other residue. This test detects undesirable impurities.



### 2. MOISTURE TEST

A sample of known weight from each cylinder is passed through  $P_2O_5$  (a desiccant). Moisture calculated by the increased weight of the tube must not exceed 50 parts per million; low moisture prevents freeze-ups and oil-sludging.

## EXTRA PRECAUTIONS

To prevent any possible contamination of "Extra Dry Esotoo" every cylinder is dry cleaned and finally rinsed with pure  $SO_2$  before filling.

Each cylinder valve is inspected and reserviced to assure trouble-free operation — this saves time and money for the service engineer.

The name "EXTRA DRY ESOTOO" on the cylinder is your guarantee of quality. Sold by refrigeration supply jobbers everywhere.



# VIRGINIA Smelting Co.

WEST NORFOLK, VA.

76 BEAVER ST. NEW YORK 5

131 STATE ST. BOSTON 4

Agents for Kinross's "Freon-12" — "Freon-11" — "Freon-113"

# Refilling

## IMPERIAL TORPEDO DEHYDRATORS

*Fast, Simple and  
Easy as A-B-C*



**SIMPLY UNSCREW AND REMOVE THE CONNECTION AT OUTLET END OF DEHYDRATOR.**

Note that on the Torpedo there are no bolts to remove—no flanges to take off.

**SHAKE OUT OLD SILICA GEL, CLEAN DEHYDRATOR AND SCREEN, HEAT TO REMOVE MOISTURE, AND REFILL WITH NEW SILICA GEL.**

No loose screens to contend with on Torpedo. Finger type monel metal screen—of welded construction—is integral with outlet connection so that screen and connection are removed at the same time. Dehydrator can be heated before refilling, if desired, because no soft solder is used in construction.

**SCREW OUTLET END BACK IN PLACE.** No soldering required after refilling on the Imperial Torpedo Dehydrator. The job is done in short order.



### **YOUR BEST WEAPON IN THE WAR ON MOISTURE**

#### **Note These Other Important Torpedo Advantages:**

One-piece streamlined shell provides greater strength, easier passage of refrigerant—has fewer joints.

Finger-type outlet screen provides more efficient filtering, less chance of clogging. Copper and brass construction throughout.

Packed with Silica Gel.

**IMPERIAL BRASS MANUFACTURING CO.**  
534 SOUTH RACINE AVE. • CHICAGO 7, ILL.



# IMPERIAL

PIPEFITTERS • VALVES • FILTERS • FLOATS  
DEHYDRATORS • CHARGING LINES • TOOLS  
FOR CUTTING, FLARING, BENDING,

**DU PONT**

*Artic*

**METHYL  
CHLORIDE**

**99.5%  
PURE**

**DRY**

**UNIT FOR KIV**



**UNIFORM**

for your  
**refrigeration needs**

SERVICE ENGINEER

**HIGH-PURITY** Du Pont Methyl Chloride is designed to meet exacting requirements.

**ORDER NOW!**—But don't hoard.

**EMPTY CYLINDERS NEEDED**—To help

keep up rapid deliveries, return all empty cylinders promptly! You'll help yourself and others! E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

**BUY AND HOLD MORE VICTORY BONDS!**

**DU PONT METHYL CHLORIDE  
SPECIFICATIONS**

Purity ..... 99.5% Methyl Chloride  
Moisture ..... 0.008% by wt. max.  
Acid as (HCl) ..... 0.001% by wt. max.  
Residue on Evaporation . . . 0.01% by wt. max.  
Boiling Range (760mm) . . . —24.6° to —23.6°C.  
Color ..... water white, clear

**DU PONT  
ELECTROCHEMICALS**



BETTER THINGS FOR BETTER LIVING  
... THROUGH CHEMISTRY



*May  
the true peace  
of this  
Christmas Season  
fill the hearts  
of all men*

**TEMPRITE  
PRODUCTS  
CORPORATION  
DETROIT**



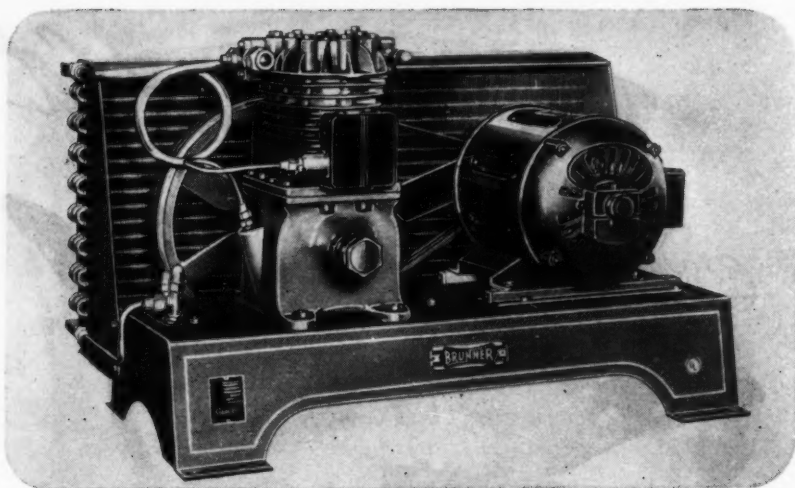
*"Come and Get It!"*



Thanks to speedy reconversion, PEERLESS OF AMERICA, Inc., can now say: "Come and Get It!" We're ready for your orders for immediate shipment on many PEERLESS products, the products of known leadership your customers are waiting for. Shown above are the PEERLESS Flash Cooler, Ice Cube Makers, Fin Coil, and Off-Center Coil. Also in production are PEERLESS Capacity Boosters and Expansion Valves. They're all rolling off the lines. Come and get 'em!

*Sold through leading refrigeration supply jobbers.*

**PEERLESS OF AMERICA, INC.**  
EXECUTIVE and GENERAL SALES OFFICES  
333 N. MICHIGAN AVENUE, CHICAGO 1, ILLINOIS, U. S. A.



## It is the component of all parts that make the whole **BRUNNER** Condensing Unit...

Brunner's responsibility does not end with the precision and close tolerance manufacturing of the component parts of Brunner Condensing Units! It is our responsibility, as well as yours, to see that every Brunner Condensing Unit keeps operating for the longest possible span of life!

For that reason one of our basic principles is service! Service by the Brunner organization, Brunner Field Men, and their jobbers and dealers furnishing parts to you so that you, in turn, can render service that will keep Brunner Condensing Units *operating!*

We aim to maintain a stock of parts for every Brunner Condensing Unit now in service. Orders for parts are filled promptly to our jobbers and distributors, or to service men direct, at their request in an emergency. In the majority of cases service men can pick up parts most frequently in demand from the stocks of Brunner jobbers and distributors. Should the jobber or dis-


tributor be temporarily out of a desired part, he can procure it promptly from the factory. Should a unit replacement be necessary this can also be arranged by the jobber or distributor. If you have a servicing problem, Brunner factory representatives are available to assist you.

When ordering parts, remember to give the model and serial number of the unit as well as the part number, whether you order from the jobber or distributor or from the factory direct.

Brunner service will help your service keep Brunner Condensing Units serving!

**BRUNNER MANUFACTURING CO.**  
UTICA 1, NEW YORK, U. S. A.





*What  
features  
do I  
need?*

#### **LOOK FOR THESE**

##### *Calibrated Dials*

*Independent adjustment of  
cut-in and cut-out pressures*

*Totally enclosed dust-proof  
snapswitch*

*Cold control adjustment*

*Tamper-proof cover*

*Capillary pressure connection*

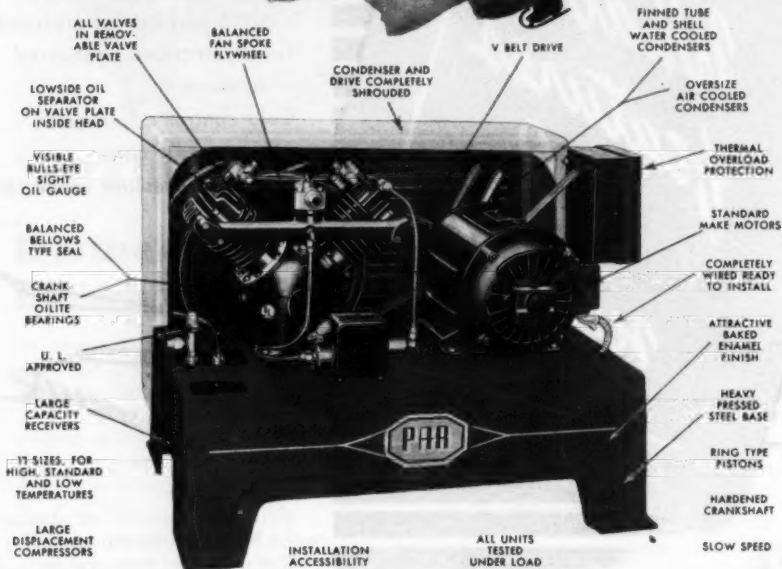
*All these features are standard  
on Minneapolis-Honeywell  
Refrigeration temperature and  
pressure controls. Many others,  
especially designed to meet  
your individual requirements, are  
available. See your Honeywell  
branch or jobber for details.  
Minneapolis-Honeywell Regu-  
lator Company, 2934 Fourth Ave  
South, Minneapolis 8,  
Minnesota.*

MINNEAPOLIS  
**oneywell**

CONTROL SYSTEMS

*Here are the*  
**24 OUTSTANDING  
 FEATURES**  
*built in every*  
**PAR CONDENSING UNIT**

PAR BY *Lynch*



**Know PAR . . . and you'll know *why* Par enjoys such unusual popularity among Jobbers, Servicemen and Users alike. Ask your Par Jobber for complete details on these PAR Features or write for Par catalogue R-96 and supplement.**

**PAR—Condensing Unit Line sold exclusively  
 through Franchised Refrigeration Supply Jobbers!**

**PAR**  
*Lynch*  
 DIVISION

*. . . By Comparison — You'll Buy PAR*  
**Manufacturing Corporation, Defiance, Ohio  
 U. S. A.**



# Superior ECONOMIZERS



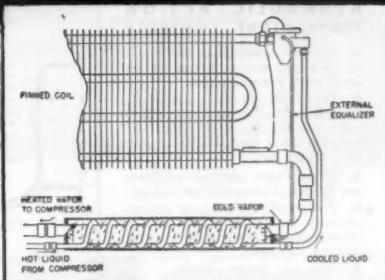
★ Increase overall capacity.

★ Reduce running time up to 20%

... prevent sweating and frosting of suction lines, as well as oil slugging, and bring "on-the-line" jobs within the normal cycle range.

## "Fractional Tonnage" ECONOMIZERS

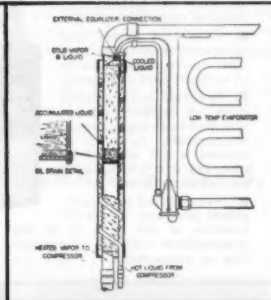
... are no longer considered "unnecessary gadgets." Data now available substantiates all claims for appreciable increase in overall capacity. One should be installed in each evaporator circuit of every commercial and industrial refrigerating system. Pressure drop is negligible ... capacity per unit size is extremely high ... all joints are silver soldered.



## "Hy-K" ECONOMIZER-ACCUMULATORS

... have high ratio of prime to secondary, and liquid to vapor surface ... Positive vapor contact with all surfaces ... Maximum capacity per unit size.

"Hy-K" Economizer-Accumulators are equally suited for use in high, medium or low temperature systems.



If you haven't a copy of the new  
Superior Catalog R-2, request one today.

No. 130

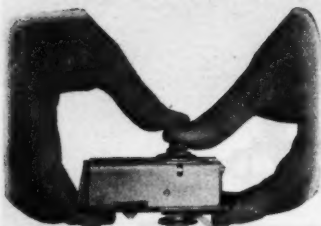
# SUPERIOR

VALVE & FITTINGS COMPANY  
PITTSBURGH 26, PENNSYLVANIA

BRANCHES IN PRINCIPAL CITIES - STOCKS - SHOWS - AND SERVICE STATIONS - CORPERS EVERYWHERE

# UNUSUALLY *STURDY*

## ★ SWITCH CONSTRUCTION

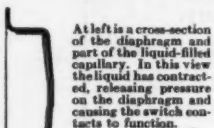


### 8 EXCLUSIVE FEATURES OF WHITE-RODGERS HYDRAULIC-ACTION TEMPERATURE CONTROLS

1. May be mounted at any angle or position, above, below or on level with control point.
2. Hydraulic-Action principle incorporating solid-liquid filled bulb and capillary provides expansion force comparable to that of a metal bar.
3. Diaphragm motion uniform per degree of temperature change.
- ★4. Power of solid-liquid charge permits unusually sturdy switch construction resulting in positive contact closure.
5. Heavier, longer-wearing parts are possible because of unlimited power.
6. Dials are evenly and accurately calibrated over their entire range because of straight-line expansion.
7. Controls with remote bulb and capillary are not sensitive to change in room temperature. Accuracy of control is not affected by temperature changes in surrounding area.
8. Not affected by atmospheric pressure. Works accurately at sea level or in the stratosphere without compensation or adjustment.

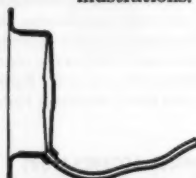


### LIMITLESS POWER OF HYDRAULIC-ACTION ASSURES POSITIVE CONTACT



CONTRACTED

In this cross-sectional view, the liquid charge of the capillary has expanded with a rise in temperature. The positive force of this hydraulic action forces the diaphragm outward and causes the switch contacts to function.



EXPANDED

Illustration of the White-Rodgers diaphragm body, the actuating element of every White-Rodgers temperature control. It is so designed as to exert FULL pressure at the point of contact with the switch mechanism.



### POSSIBLE BECAUSE OF THE SOLID-LIQUID CHARGE

Switches on White-Rodgers controls are so sturdy and strong that it takes all the pressure you can exert with *two* thumbs to make them click. The power of Hydraulic-Action is so great that it readily overcomes this resistance. Because of that power, White-Rodgers can and does build a better, *sturdier* switch into all its controls—a switch that is built to last.

## WHITE-RODGERS ELECTRIC CO.

1292C CASS AVENUE

ST. LOUIS 6, MISSOURI



*Controls for Refrigeration • Heating • Air-Conditioning*

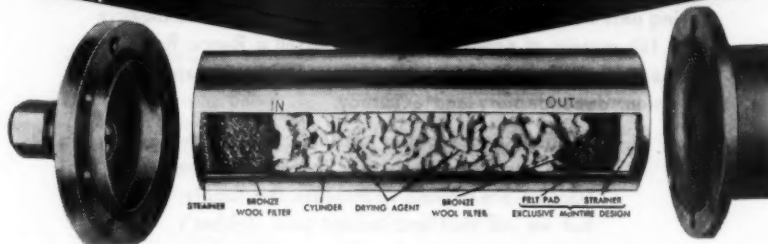
# 3 Problems!

MOISTURE  
SEDIMENT  
ACID



# 1 Solution!

**Triple-action DFN System Controls  
Moisture, Sediment and Acid!**



• DFN is much more than a dehydrator. It's a highly successful System for controlling moisture—sediment—and acid—with a single product! In the DFN Cartridge, drying agents are mechanically packed, thoroughly reactivated, then hermetically sealed, to provide full-strength dehydration and neutralization. In addition, an exclusive strainer-filter assembly at both ends, holds more sediment without pressure drop—filters to minute size.

Furthermore, the DFN System stays on the line longer—is easier, faster to service—costs less to maintain—does not absorb moisture from the air while being serviced—provides greater flexibility to combat any combination of moisture, sediment and acid.

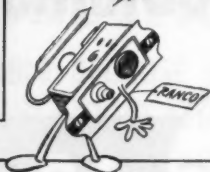
For the complete facts behind this performance, ask your distributor or write us direct. Catalog R-7 on request.

**McINTIRE CONNECTOR CO., NEWARK 5, N. J.**



1. GOOD MARGIN OF PROFIT.
2. QUICK, EASY INSTALLATION.
3. ALL TYPES FOR GENERAL AND EXACT REPLACEMENT.

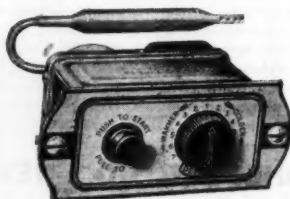
MR. DEALER, HERE'S HOW YOU AND I CAN MAKE MORE MONEY FOR YOU — BY WORKING TOGETHER.



## *It's just simple logic . . .*

You want your replacement work to be satisfactory to build consumer good-will; to keep present equipment operating until new units are available; to actually earn and deserve a fair margin of profit. When you install a Ranco Replacement Control you and your customer confidently expect precision, dependability and accuracy.

Your Ranco Jobber carries a more complete line of controls now than during the war; we are striving to increase this supply; but we ask that you accept your Jobber's recommendations when certain instruments are temporarily unavailable.



# *Ranco Inc.*

COLUMBUS 1, OHIO

# THE REFRIGERATION SERVICE ENGINEER

The  
National Magazine  
of  
Refrigeration  
Sales, Service  
and Installation

Published Monthly by  
Nickerson & Collins Co.  
433-435 North Waller Ave.  
Chicago 44

Telephones Austin 1303-1304-1305

Publishers of Technical Books and  
Trade Journals Serving the Refrig-  
eration Industries for over 50 years.

H. T. McDERMOTT, *President*  
H. T. CURTIS, *Vice President*  
L. R. TOWNSLEY, *Sec.-Treas.*

H. T. McDERMOTT  
*Editor and Publisher*  
H. D. BUSBY, *Managing Editor*  
*Associate Editors*  
EMERSON A. BRANDT  
E. R. CURRY

L. R. TOWNSLEY, *General Mgr.*  
HELEN G. SMITH, *Asst. Mgr.*  
A. M. WILLCOX, *Eastern Mgr.*

*Advertising*  
R. L. HENDRICKSON  
EDW. DAVISON  
K. A. HAMILTON

*Official Organ*  
REFRIGERATION SERVICE  
ENGINEERS SOCIETY

**EASTERN OFFICE**  
420 Lexington Ave., New York 17  
Telephone Lexington 2-4816

Subscription Rates United States  
\$2.00 per year. Single copies 25c  
All other countries \$3.00 per year

Copyright, 1945  
by Nickerson & Collins Co., Chicago, 44

Vol. 13 DECEMBER, 1945 No. 12

## Contents

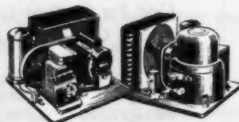
In This Issue.....	21
First New Refrigerators Going to Dealers Floors.....	23
Refrigerants, Their Physical and Refrigerating Properties —by Guy R. King.....	28
Installation and Operation of Airtemp Conditioners.....	31
Warton School in England.....	35
A Trip Through Deep Sleep.....	36
Service Pointers .....	38
The Case of the Oscillating Pump.....	38
Cold Pot for Cold Controls.....	39
Testing Grunow Units.....	39
Questions and Answers.....	40
Comments on Question 719.....	40
Montgomery Ward Pump Oil.....	40
Universal Cooler Trouble.....	40
Carbon-Tet in SO <sub>2</sub> .....	41
What of the Future of Refrigeration Service.....	42
Southwest Jobbers Meet.....	52
REMA Fall Conference Attracts Record Attendance....	52
New Advisory Committee Holds First Meeting.....	54
Book Review .....	54
R.S.E.S. News .....	56
Chapters in the Making.....	56
Chapter Notes .....	58
News from The Dispatcher.....	66
New and Improved Appliances.....	68
New Low-priced Welder.....	68
Cutting Tool Grooves Plaster.....	68
Frigidaire Home Freezer.....	70
Blue Flash Coolers Return.....	70
Flexigrip Tubing Fitting.....	72
Adjustable Capillary Tube.....	72
New Air Duct.....	72
News of the Industry.....	74

# KELVINATOR CONDENSING UNITS

*NOW*  
*Competitively Priced*  
*AND*  
*Conveniently Warehoused*

—★  
Increased facilities—production techniques developed during wartime—plus the adoption of certain basic merchandising fundamentals applied so successfully by Kelvinator in the household refrigerator field, have made possible this complete new sales-minded policy for Kelvinator Condensing Unit merchandising.

Production is now confined to a simplified, compact line of models that cover the require-



—★  
ments of the vast majority of commercial condensing

unit users.

And Kelvinator's warehousing system has been expanded to 51 convenient distributor and branch points throughout the United States. Now Kelvinator trouble-free Condensing Units are available, competitively priced and conveniently warehoused. NASH-KELVINATOR CORPORATION, Detroit.

**BUY KELVINATOR FOR YOUR COMMERCIAL REFRIGERATION REQUIREMENTS**

**Kelvinator** CONDENSING UNITS  
OPEN AND SEALED





# IN THIS ISSUE~

A preview together with specifications and description of special features on the new refrigerators now going out to dealers displays is contained on pages 28 to 27. Included is a new make of refrigerator combining a three cubic foot freezer section. Other makes shown are the old manufacturers of prewar years.

Starting on page 28 is the second article in the series on Refrigerants—Physical and Refrigerating Properties. An interesting analysis of both the commonly used and less frequently used refrigerants, their advantages and disadvantages in various applications.

The fourth article in the series on the installation and operation of the Airtemp Conditioner starts on page 31. In this article the adjustment of the system is explained and some of the common troubles and their remedies are given.

The Warton School in England described on page 35 is another example of the efforts being made by our armed forces to give the G.I. training of a useful nature to him when he is released from the service. One of the several set up in European countries where American forces are on duty, the Warton School with an expected enrollment of 4000 offers training in nearly every common trade.

We have read and heard a great deal of the wonders to be expected in the postwar years, but the article on page 36 seems to be the ultimate in such dreams. If you are troubled with the current difficulties perhaps this article will appeal to you. At least it may provide a smile.

One of the Service Pointers on page 38 of this issue is an amusing story of one service call which in the final analysis proved to be a simple trouble with a simple answer. The peculiar actions of the unit, however, tend to lead the mind into baffling channels.

The Questions and Answers Department on Page 40 again offers some interesting problems and their answers on troubles encountered in the service field.

What of the future of refrigeration service was the subject of a town hall discussion at a recent meeting. The papers of the four speakers who expressed their views are reproduced on page 42.

An account of the Southwest Jobbers Annual Meeting and Luncheon and a report of the REMA fall meeting appears on page 52.

The long list of chapters in various stages of formation contained on pages 56 and 58 is evidence of the rapid growth of the Society. There are nearly 100 chapters and a total membership of over 5000 throughout the United States and Canada.

News from The Dispatcher this month on page 66 provides activities of service men and service companies.

Under New and Improved Appliances on page 68 are several interesting new tools and appliances. One a new grooving tool for plaster should also be useful in refrigeration work. Another, an adjustable capillary tube may be the answer to applying this type of refrigerant control to the different makes of refrigerators in the field.

\*\*\*

## THE COVER

WHEN Sergeant Edmund E. Farr, of Terre Haute, Indiana, was in the combat zones in Europe, he served as a radio repairman with the 92nd Signal Battalion. Now he is a student in refrigeration at the Warton American Technical School in England and intends to combine his skill in both trades as a civilian. He has just finished installing the gauges and was purging a line when the photographer visited the shop. Sgt. Farr is one of 124 soldier-students who are enrolled in an eight-week course in refrigeration at Warton. See article on page 35.



With many of our friends returning to their civilian activities, it is particularly appropriate in this year of victory to extend to all our best wishes for a Merry Christmas and a New Year of Peace, Happiness and Prosperity.

**Highside Chemicals Co.**

**195 VERONA AVE.**

**NEWARK 4, N. J.**

# First New Refrigerators

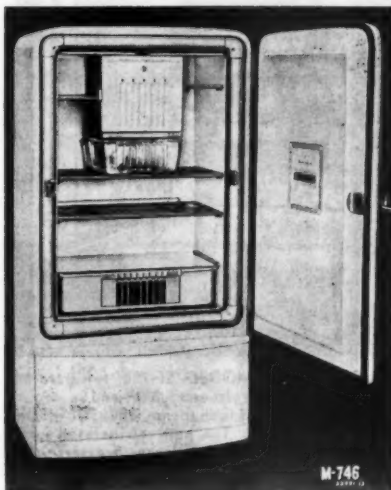
## Going To Dealers Floors

**R**EFRIGERATOR production that will allow consumers to view and select models in dealers' stores, but no consumers deliveries in volume in time for "the family's Christmas present," seems to be the prediction of the average manufacturer as this showing goes to press.

Some of the first postwar makes and models which are now going out to dealers are illustrated and described on these pages. Perhaps the most noticeable and persistent change in these over the 1942 models is the emphasis on and increased space devoted to the storage of frozen foods.

---

**THE NORGE REFRIGERATOR** shown at right is the 1946 7 cubic foot M-746 and is one of the two first models to be announced. The other model M-746-A is identical in outside appearance but with fewer interior conveniences.



**THE LEONARD HI-HUMID** 9 cubic foot refrigerator has provisions for freezing and storage of 35 lbs. of frozen foods and 9 pounds of ice cubes, storing of foods with high moisture content and storing of average foods.

### Leonard Refrigerators

New interior and exterior styling mark the new Leonards—three seven-foot models and one nine-foot model. The three seven cubic foot models are rolling from production lines, and the nine cubic foot model is anticipated soon.

The 1946 line is topped by the new Leonard Hi-Humid refrigerator, illustrated. The lowest-priced is the SL-7, the lead-off model, a seven-cubic foot unit with 12.2 square feet of shelf area; a freezer capacity of 24 pounds of packaged frozen foods and ice cubes.

The second model is the seven-foot L-7, which carries four additional features: the roomy vegetable crisper, a sliding meat chest with a capacity of 12 pounds, the five-way "Presto" and a  $1\frac{1}{4}$  bushel vegetable bin.

Next in the line is the third seven-foot model, the DL-7, with double crispers topped by crystal-clear glass covers, 18.1 square feet of shelf area, and a freezer capacity of 30 pounds of packaged frozen foods and ice cubes.

Developments common to all models are: Freon-12 refrigerant; sealed condensing unit with a five-year protection plan.



THE GIBSON MODEL SF-796 refrigerator embodying a super freezer shelf and a moist chiller compartment occupying the full width of the refrigerator. The new refrigerator soon to be available will have larger freezers and chiller compartments.

### Gibson Refrigerators

The new Gibson refrigerator features a freezing unit which extends the full width of the refrigerator. Larger than shown in the accompanying illustration, the new freezing compartment will be known as the freezer locker and will be completely surrounded by coils. It will be able to freeze foods as well as store them.

The moist chiller compartment directly below the freezer will also be larger and will provide temperatures just above freezing and humidities as high as 90%.

Claims made for this design are that the cold air dropping off the freezing unit across the entire width of the food compartment slows down circulation of the air and eliminates any great variation in food compartment temperatures.

### Hotpoint Refrigerators

The first electric refrigerators since April 1942 off the Edison General Electric (Hotpoint) Appliance Co. lines at Erie, Pa., are two models, both having seven cubic feet capacity.

The first model off the line has "bright" trim, a "six-way" cold storage compartment, and humidity vegetable compartment; the

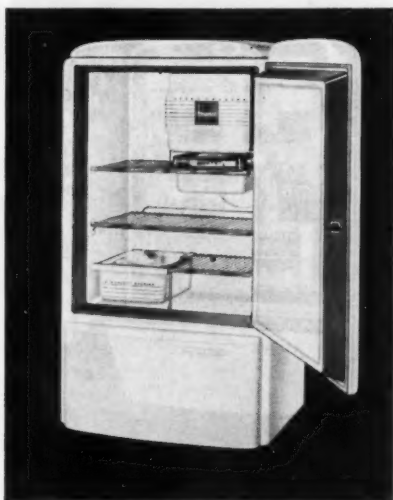
other model is designed to sell at "lowest price."

The standard model is the Hotpoint Doric EB7 with 7 cubic feet capacity, and 13.4 square feet shelf area. It has a newly designed Hotpoint Thriftmaster unit, with increased power. The exterior is coated with double Calgloss enamel, with the interior a one-piece porcelain construction.

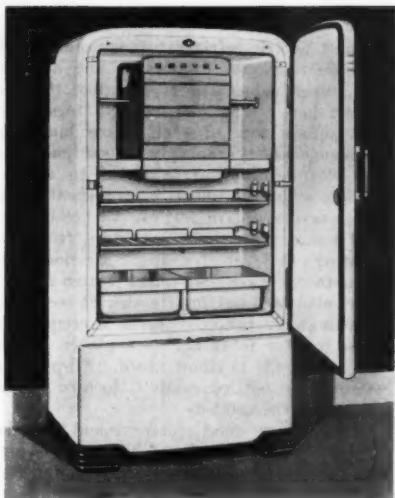
Equipment includes: pop-out ice cube trays, high humidity vegetable compartment drawer with heavy glass cover, one sliding shelf of heavy rust-resistant wire, and a six-way cold storage compartment. The over-all dimensions are: 59 inches high, 31 inches wide, and 28½ inches deep, including ventilation space and door handle.

The "economy" Hotpoint Doric model is similar in exterior trim, finish and dimensions, as well as in fundamental operating parts. It does not have the sliding shelf nor humidity storage drawer of the standard model.

A standard seven cubic ft. Hotpoint refrigerator at \$188.00; and the lowest priced model at \$151.50, both prices complete, delivered to consumers in any part of the nation, were announced as approved by OPA, by Edison General Electric (Hotpoint) Appliance Co. The prices are approximately the same as 1942 prices for these models.



THE HOTPOINT Standard Doric Model EB7 refrigerator. It has 7 cubic feet storage capacity and a shelf area of 13.4 square feet.



THE SERVEL model R-800 gas refrigerator. This is one of the five models the company is producing for its 1946 line.

### Servel Refrigerators

The Servel 1946 line includes a total of five models—two deluxe models, the R-600 and R-800, and three standard models, the R-400-A, R-600-A, and R-800-A.

The R-400-A, the lowest priced model in the standard line, has a shelf area of 9 square feet and storage capacity of 4 cubic feet. It has 2 ice trays, one dessert tray with a capacity of 36 cubes.

The R-600-A has a shelf area of 11.98 square feet and storage capacity of 6.06 cubic feet. The ice cube trays and one dessert tray provide an ice capacity of 64 cubes.

The R-800-A has a storage capacity of 8.07 cubic feet and shelf area of 16.86 square feet. Seven ice cube trays and one dessert tray provide a total of 144 ice cubes.

In the deluxe line the model R-600 has a shelf area of 13.1 square feet and food capacity of 6.16 cubic feet. It is equipped with five ice trays and one dessert tray supplying 112 ice cubes.

The model R-800, illustrated, has a shelf area of 16.08 square feet, storage space of 8.07 cubic feet and is equipped with seven ice trays and one dessert tray providing 144 cubes.

Features of Servel line are flexible interiors to save time and space; temperatures and humidity for each different kind of food.

### Frigidaire Refrigerators

Two models of the Frigidaire line are now coming off the production lines. First off the line is the model M 1-7, illustrated.

The M 1-7 super freezer has two double-width fast freezing shelves with self-closing door; two 2-pound and one 4-pound ice or dessert tray equipped with tray and cube release; total ice capacity is 8 pounds. The frozen food storage capacity is 705 cubic inches, plus 4 pounds of ice.

The meat tender is an opalescent glass, drawer type tray, 4 $\frac{3}{4}$ " deep for storing meats. Has a capacity of 462 cubic inches. The Hydrator is a glass top drawer type with 550 cubic inch capacity.

The D 1-7 is a 7 cubic feet deluxe model with 15.1 square feet of shelf area. Four 2 pound and one 4 pound ice or dessert trays with tray and cube release have a capacity of 12 pounds of ice. Frozen storage is 705 cubic inches plus 4 pounds of ice.

The opalescent glass drawer type meat tender 4 $\frac{3}{4}$ " deep has a capacity of 462 cubic inches. The defrosting tray serves as a cold storage tray for shallow articles such as extra ice cubes, and as a cover for the meat tender. It has a capacity of 118 cubic inches. The Hydrator has a 583 cubic inch capacity.



THE FRIGIDAIRE M1-7 containing 12 square feet of shelf space and 7 cubic feet storage space. It is equipped with meter-miser unit, baked enamel finish, meat tender and Quickube ice trays.



THE KELVINATOR MM-9 refrigerator in addition to new styling inside and out, reveals great emphasis on frozen food storage. This nine cubic foot Moist-Master is, in effect, a combination refrigerator and frozen food chest.

### Kelvinator Refrigerators

The new Moist Master (illustrated) is in effect a combination refrigerator and frozen food chest. The new unit has a freezer capacity of 9 pounds of ice-cubes and 35 pounds of frozen foods. Its net capacity is nine cubic feet. For high moisture foods, the cold mist freshener employs cooling coils concealed in the walls of the cabinet surrounding the freshener.

Lead-off model of the 1946 series is the CS-7, the lowest-priced of the group. Incorporating all of the basic construction features, the seven-cubic foot unit has 12.2 square feet of shelf area, with a freezer compartment capacity of 9 pounds of ice cubes, and 20 pounds of packaged frozen foods. The next step upward in the line is to the C-7, a seven foot model with four additional features: the vegetable crisper, a sliding meat chest, with a capacity of up to 12 pounds, the five-way "Magic Shelf" and a  $1\frac{1}{4}$  bushel vegetable bin. Next higher in the line is a third seven-foot model, the CD-7, which has double crispers with clear glass covers, 18.1 square feet of shelf space and a freezer capacity of nine pounds of ice cubes and over thirty pounds of packaged frozen foods.

### Westinghouse Refrigerators

First electric refrigerators now rolling off the Westinghouse production line are the B-7, seven cubic foot models, like the one shown here. The new refrigerators have 12.4 square feet of shelf space including storage capacity for frozen food packages and flexible shelf arrangement to accommodate eight full quarts of milk in the new space saving square bottles. Choice of several temperature controls ranges from defrosting to fast freezing. Sectionalized evaporators have two-quart frozen-dessert tray, plus facilities for freezing 84 ice cubes in a single operation. Vegetable crisper has glass top for inventory at a glance. Door latch responds to elbow touch. All-purpose storage for bottled goods is located in the bottom of the cabinet.

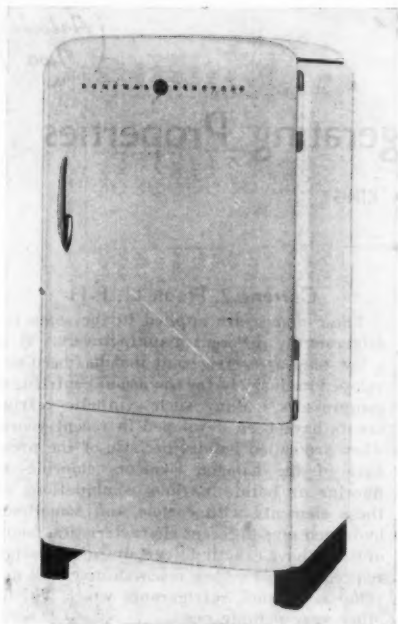
The frozen food compartment in the freezer or evaporator of the new refrigerator is two-thirds larger than in the last prewar model and will hold 10 pounds of frozen foods. Up to 15 pounds of meat can be stored in the vitreous enamel meat keeper. This pan slides under the freezer and is easy to remove when packed with meat.

The Westinghouse hermetically sealed unit is located in the bottom of the cabinet. Other models are to be put in production shortly.



THE WESTINGHOUSE B-7 refrigerator is a 7 cubic foot model with 12.4 square feet of shelf space. The freezing and storage space for frozen foods has been greatly increased.





**GENERAL ELECTRIC** refrigerator model LB7 has 7 cubic feet of storage space and 12.6 square feet of shelf area. It is finished in Glyptal bakel enamel.

### General Electric Refrigerators

In addition to the model LB7, illustrated, the General Electric line includes two more models. Refrigerator, Model JB7-D, a 7-cubic foot model with 13.4 square feet of shelf area. It makes 80 cubes, or 8 pounds, of ice. The refrigerator incorporates a hermetically sealed refrigerating mechanism. Entire operation of the appliance is controlled by a single knob. The stainless-steel Super-Freezer is mounted near the side of the cabinet, to provide the maximum amount of usable shelf area. A Tel-a-Frost indicator notifies the user when it is time to defrost. The cold storage compartment directly under the Super-Freezer provides low temperature with high humidity for preserving fresh meats. Vegetables are kept in a porcelain-finished drawer with a glass cover. Exterior of the cabinet is of durable high-luster Glyptal baked enamel; the interior is of durable porcelain.

Model LB6-H, a 6.1 cubic foot model with 11.8 square feet of shelf area. It makes 8 pounds of ice. The refrigerator mechanism

is similar to the JB7-D's and the appliance also includes a side-mounted Super-Freezer and Tel-a-Frost indicator. The three shelves, which are not adjustable, are made of round tin-dipped steel wire welded to a steel frame. A glass chiller tray fits directly under the Super-Freezer. The cabinet exterior is finished in Dulux, a liquid plastic; the interior is porcelain.

### The New Frostor Refrigerator

**T**WO of the nation's best known manufacturers today announced their joint entrance into the electric refrigeration field.

The General Tire & Rubber Company, of Akron, and The Liquid Carbonic Corporation, of Chicago, in a joint statement, announced the formation of Frostor and the coming introduction of the first new combination refrigerator and freezing unit for the home.

The combination brings together General Tire's background of high manufacturing standards, exceptional dealer relations and public confidence, and Liquid's 45 years of experience in the commercial refrigeration field.

To produce the new Frostor, a million dollar factory is under construction at Morrison, Illinois. This building has been engineered specifically for the production of

*(Continued on page 34)*



**FROSTOR**, a new make of refrigerator, soon to appear on the market, is said to be the first combination refrigerator and home freezer

# Refrigerants—

(Article  
Two)

## Physical and Refrigerating Properties

By GUY R. KING\*

TABLES III and IV combine the factors discussed in the November issue in an overall comparison of the various refrigerants.

To compare the list of requirements of a good refrigerant with the properties of water would seem to make a very poor refrigerant of this common fluid. The enormous volume of its vapor at required evaporator temperatures is such that the use of an ordinary compressor is impossible. High vacuums are required in both the low and high pressure sides of the system. The required vacuum on the low side is so high that it is difficult to maintain. Leaks are difficult to find. Their only evidence is when air leaking into the system prevents proper operation. To check for a suspected leak the system must be charged with compressed air and all points tried with soap suds. The 32° freezing point makes it impossible to use it for ordinary applications.

However, for certain applications above 32° such as chilling large quantities of water and for air conditioning, it has satisfactorily filled some very rigid requirements. First, it is absolutely safe. It has no odor or poisonous properties, and it is not inflammable. If any amount of it were accidentally released in a crowded building, it would not cause panic.

The problem of handling the excessive volume of the low pressure vapor has been solved by the development of centrifugal compressors and steam ejectors, either of which will easily handle large volumes of vapor at low pressure. The steam jet system using water as a refrigerant has been used extensively in the air conditioning of passenger trains. Its lack of hazard and availability, plus the absence of mechanical compression equipment, make it a very desirable refrigerant where the rough service of railroad conditions makes leaks more probable than in stationary systems.

\*Instructor, San Francisco Chapter, NAPRE

### Carrene 2, Freon 11, F-11

These names are applied to the same refrigerant by different manufacturers. It is a low pressure refrigerant that has been developed exclusively for the use of centrifugal compressors. Many such synthetic refrigerants have been developed in recent years. They are called halides because of the presence of the halogen elements chlorine or fluorine or both. Various combinations of these elements with carbon and sometimes hydrogen give different characteristics, many of which have exactly fit certain refrigerating requirements. Further research may well develop more such refrigerants which will fit other very definite needs.

These halides are somewhat similar to ether. Carrene 2 (Freon 11) has a sweet ethereal odor. Both the liquid and the vapor are clear and colorless. The liquid is quite heavy, having a specific gravity of 1.57 at 5°. This means it is about one and one half times as heavy as water. The vapor has a specific gravity of 4.85 at atmospheric pressure. This makes it nearly 5 times as heavy as air. With such a heavy, dense liquid and vapor, pipe lines, passages in compressors, and valve openings must be of liberal size, and have a minimum of bends or other restrictions. Otherwise excessive pressure drops would occur.

Its boiling temperature at atmospheric pressure is 74.7°. Thus it must be operated at a vacuum to produce refrigeration temperatures. Because of its high boiling point, it can be shipped in drums similar to oil drums. The low pressure (vacuum) and large volume of this refrigerant make it well suited to the characteristics of the centrifugal compressor. This eliminates the pressure and volume difficulties listed as disadvantages in the first three items of Table I.

It will mix with oil in any proportion and thin out the oils, as do all halogen refrigerants. Compression equipment particularly centrifugal compressors can be designed with

TABLE III.—REFRIGERATING PROPERTIES OF COMMON REFRIGERANTS

	Water	Carrene 2 Freon 11	Sulphur Dioxide	Methyl Chloride	Freon 12	Ammonia	Freon 22	Carbon Dioxide
1. Maximum Refrigeration per cu. ft. ....	Poor <sup>1</sup>	Poor <sup>1</sup>	Poor	Fair	Good	Good	Good	Good
2. Reasonable Condensing Pressure. ....	Poor	Good	Good	Good	Good	Good	Good	Poor
3. Reasonable Evaporating Pressure. ....	Poor	Poor	Fair	Good	Good	Good	Good	Poor
4. Stability. ....	Good	Good	Good	Good	Good	Good	Good	Good
5. No Effect on Metals. ....	Good	Good	Good	Good	Good	Good	Good	Good
6. No Effect on Oil. ....	Good	Fair	Good	Fair	Fair	Good	Fair	Good
7. High Critical Temperature. ....	Good	Good	Good	Good	Good	Good	Good	Poor
8. Non-Poisonous; Non-Irritating. ....	Good	Good	Poor	Poor	Good	Poor	Good	Good
9. Non-Inflammable. ....	Good	Good	Good	Fair	Fair	Good	Fair	Good
10. Availability; Cost. ....	Good	Fair	Good	Fair	Fair	Good	Fair	Poor
11. Ease of Finding Leaks. ....	Poor	Good	Good	Good	Good	Good	Good	Poor
12. Power Required. ....	Good	Good	Good	Good	Good	Good	Good	Poor
13. Freezing Point. ....	Poor	Good	Good	Good	Good	Good	Good	Fair

<sup>1</sup> Except for use with centrifugal compressors.

TABLE IV.—REFRIGERATING PROPERTIES OF SOME OTHER REFRIGERANTS

	Carrene 1	Methyl Formate	Ethyl Chloride	Thermon Zeon Freon 21	Butane	Isobutane	Propane
1. Maximum Refrigeration per cu. ft. ....	Poor <sup>1</sup>	Poor	Poor	Poor	Poor	Poor	Good
2. Reasonable Condensing Pressure. ....	Poor	Poor	Good	Good	Good	Good	Good
3. Reasonable Evaporating Pressure. ....	Poor	Poor	Poor	Poor	Poor	Fair	Fair
4. Stability. ....	Good	Good	Good	Good	Good	Good	Good
5. No Effect on Metals. ....	Good	Good	Good	Good	Good	Good	Good
6. No Effect on Oil. ....	Fair	Good	Poor	Fair	Fair	Fair	Fair
7. High Critical Temperature. ....	Good	Good	Good	Good	Good	Good	Good
8. Non-Poisonous; Non-Irritating. ....	Good	Poor	Good	Good	Good	Good	Good
9. Non-Inflammable. ....	Fair	Poor	Poor	Fair	Poor	Poor	Poor
10. Availability; Cost. ....	Fair	Poor	Fair	Fair	Good	Good	Good
11. Ease of Finding Leaks. ....	Good	Poor	Fair	Fair	Poor	Poor	Poor
12. Power Required. ....	Good	Good	Good	Good	Fair	Fair	Poor
13. Freezing Point. ....	Good	Good	Good	Good	Good	Good	Good

<sup>1</sup> Except for use with centrifugal compressors.

this in mind, and most of the difficulties that might be encountered with such a condition eliminated.

It will dissolve any natural rubber material, so this must be kept in mind when selecting gaskets. Synthetic, oil resisting rubber will hold it.

Leaks in the high side may be checked with a halide torch. If there is a leak in the low side, a charge of air must be added to bring the pressure above atmospheric. A mixture of air and refrigerant escaping from a leak will still be indicated on the halide torch.

It satisfactorily fits all other requirements of a good refrigerant listed in Table III. It is ordinarily safe, being non-toxic and non-inflammable. It will break down to toxic compounds in a flame. Its freezing point or critical temperature impose no limitations on ordinary requirements. It is available through two different manufacturers, although its price is high. Its horsepower requirements are among the lowest.

It was originally developed for air conditioning work, which required a safe refrigerant. It still has a wide-spread use in this application. It has also been adapted to many industrial jobs, mainly where safety is paramount. Many Maritime Commission refrigerated ships have been equipped with it.

A centrifugal compressor cannot be built in small sizes, so cannot be used on domestic or commercial applications. This does not mean that this refrigerant cannot be used on such applications, since refrigerants with similar characteristics have been used with rotary compressors. However, such applications have been limited, and there is no reason for them to be any more popular. Therefore, little, if any use of this refrigerant may be expected in small applications in the future.

There may well be an increase in its industrial use, particularly in large sizes. The larger the size or capacity of the required system, the greater is the advantage of the centrifugal compressor. Any increase in this type of compressor will of necessity increase the use of the refrigerant best suited to it.

### Sulphur Dioxide

This is the gas obtained by burning sulphur, and that is the way most of it is made commercially. It is easily recognized by its sharp, irritating odor. The pure liquid is clear and colorless, but if it escapes in liquid form, it will absorb enough moisture and oxygen from the atmosphere to turn it yellowish. The vapor is colorless. The liquid

has a specific gravity of 1.47 so is about one and one half times as heavy as water. The vapor has a density of 2.56 at atmospheric pressure. Its boiling point at atmospheric pressure is 14° F.

The volume of sulphur dioxide is large compared to other common refrigerants, but not so large that a reciprocating compressor cannot be used. A vacuum is necessary for an evaporator temperature below 14° F. The head pressure is low.

### Corrosive and Irritating

It is highly corrosive if water is allowed to enter the system.<sup>1</sup> It can be purchased pure and dry, and it must be kept that way. Any air entering the system will contain atmospheric moisture. This can very easily happen if the system is operating at a vacuum with a leak on the low side, even a small shaft seal leak. Oil left open to the air may absorb moisture enough to cause damage when used in a system with sulphur dioxide. Corroded and sticking expansion valve needles and gummed up compressor valves are the least to expect with moisture in a system. And pistons frozen in cylinders are not uncommon. It is well to remember, though, that moisture in any system will cause some corrosion, besides freezing out at the expansion valve and plugging it with ice. So with sulphur dioxide, the damage caused by moisture is only more sudden and more severe than with other refrigerants.

Sulphur dioxide is highly irritating and toxic. It is so irritating that one will not stay in it if he is physically able to get out. It is non-inflammable. It is one of the cheapest refrigerants available.

It gives no lubrication problems if oil used is properly refined and has been kept clean and dry. Only a small amount of refrigerant can be dissolved in the oil. Since the refrigerant is so heavy, the oil floats on top of it like on water.

It is very easy to find leaks. First, the odor gives instant warning. Second, SO<sub>2</sub> forms a dense white smoke when it comes in contact with ammonia. Sufficient ammonia is easily obtained from a small swab on the end of a stick or wire which has been dipped in a solution of industrial aqua ammonia. If this is held near the suspected joint, a white smoke, apparently coming from the leak is positive indication.

(Continued on page 34)

<sup>1</sup> Sulphur dioxide plus water gives sulphurous acid. If oxygen (in air) is present, the sulphurous acid may oxidize to sulphuric acid.

# Installation and operation of Airtemp Conditioners

(Article  
Four)

## SERVICE DIAGNOSIS

### Will Not Start

**R**EMOVE the compressor access door and check the characteristics of the compressor motor nameplate to see that it agrees with the available power supply. If so, press in on the front of the magnetic starting switch for a few seconds and then release it. If the compressor does not start, investigate:

(a) *No Current*—Use a test lamp and test for no voltage. This may be due to a temporary interruption of power, a blown fuse or a loose terminal in the line voltage circuit. Determine the reason and correct it.

(b) *Damaged Compressor Motor*—If there is voltage at the compressor motor terminals in the compressor terminal box, and the compressor will not start, the fault lies with the compressor motor and compressor must be replaced.

The capacitor, transformer and relay on single phase units should be tested as follows:

1. Connect an ac voltmeter (250-volt scale) across terminals of relay holding coil. When compressor switch is turned on and compressor operates normally, the voltmeter will show a gradual increase in voltage across the relay coil from (0 to 160 volts, Westinghouse Motors)-(0 to 190 volts, Century Motors) and the relay will transfer from starting to running contacts at approximately (125 volts, Westinghouse)-(105 volts, Century).

2. Low voltage at this point or blowing of line fuses, indicates one of two sources of trouble, either the winding of the compressor motor is grounded or shorted, or, the capacitor and transformer assembly is at fault. Disconnect the red wire of the compressor cable at the relay. Turn the switch to starting position and if voltage does not rise to near normal, the capacitor and transformer must be removed and tested separately.

3. If necessary, remove the capacitor and disconnect the sections so they can be tested separately with a test lamp by charging the

capacitor first, then discharging it by shorting the terminals with an insulated handle screw driver. A good unit will show a discharge when shorted in this manner and if the capacitor under test will hold a charge for at least one minute, it is in good condition.

If the compressor starts when the magnetic starting switch is closed manually, investigate:

(a) *Resets*—Press in on the reset button or buttons and release slowly.

(b) *Overload Heater Coils Damaged*—If either of the overload heater coils are damaged or broken, it must be replaced with a new one.

(c) *Low Voltage Contacts Open*—This may be due to:

1. Thermostat Set Too High—Turn the switch to the right or to a "colder" position.

2. Low Pressure Control—If the low pressure control is breaking the low-voltage circuit, it may be due to a shortage of Freon, a stuck-shut expansion valve, incorrect control setting, or a damaged control and it may be necessary to add Freon, replace the expansion valve, or reset the low-pressure control.

3. High Pressure Control—If the high pressure control is breaking the low voltage circuit, it may be due to stoppage, high temperature, or interruption of the condensing water; incorrect water valve setting, incorrect control setting, air in the system or a damaged low-pressure control. It may be necessary to investigate the water supply, water valve and water-valve setting, reset the low-pressure control, purge air, or replace the low-pressure control.

If the above parts are in good order, further investigation will include:

(a) *Low Voltage Transformer*—Swing out or loosen the control panel and use a test lamp at both the primary and secondary leads on the transformer. If it is at fault, it must be replaced.

(b) *Magnetic Switch-Holding Coil*—Test for voltage at both sides of the holding coil and if it is at fault, it must be replaced.

(c) *Fan and Compressor Switch*—Use a test lamp to see that the contacts just back of the switch are making and to see that the switch is not at fault or turning. If the switch is at fault, it must be replaced.

### Runs But Does Not Cool

Attach an oil pressure gauge, suction pressure gauge and discharge pressure gauge, then investigate:

(a) *Freon Charge*—

(b) *Expansion Valve*—A stuck-open expansion valve will cause a reduction in the amount of cooling produced. This condition is accompanied by a cool or cold crankcase and the expansion valve should be replaced.

(c) *Fan and Fan Motor*—See that air is being drawn into and discharged from the conditioner. If not, it may be due to a loose or damaged belt, loose fan or motor pulley, damaged fan motor, or overload protection switch, and the part at fault must be adjusted properly or replaced.

(d) *Filter*—See that the air filter is not so clogged with dust and dirt that it impedes the flow of air into the conditioner. If it does, it must be replaced with a new filter. See Operating Instructions attached to the conditioner.

(e) *Oil Pressure*—The oil pressure should be at least 20 pounds above the suction pressure when the conditioner has been operating five minutes or longer. If the oil pressure is the same as the suction pressure and there is no indication of oil leakage on the compressor or oil cooler, the compressor must be replaced.

If there is indication of oil leakage, add one pint of oil to the compressor. Operate the compressor several minutes and if the suction and oil pressure are still the same, the compressor must be replaced.

(f) *Oil Separator*—Observe the temperature of the oil return line between the oil separator and the compressor crankcase. If the line is near the room temperature it is normal. If the line is hot, it indicates that discharged gas is leaking past the oil return float and the oil separator must be replaced.

(g) *High Discharge Pressure*—Attach a discharge pressure gauge and see that the operating discharge pressure is not excessive. If the discharge pressure is higher than 150 pounds, check the condenser cooling and possible air in the system.

See if there has been a change in the heat load of the conditioned area such as open

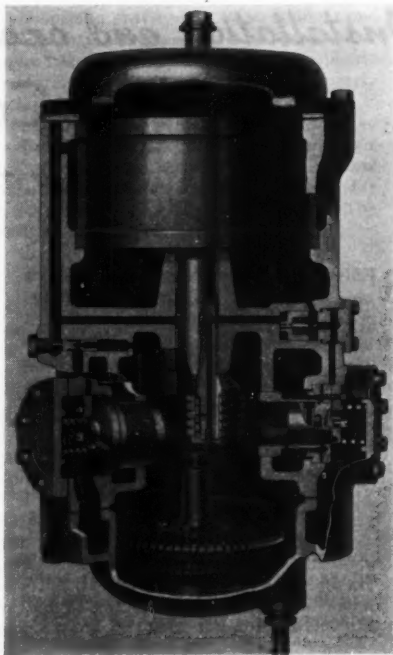


Fig. 8. Cut-away view of the AHC-5 motor-compressor unit.

doors, or windows, increased light load, number of persons, or quantity of fresh air introduced. It may be necessary to measure the quantity of air being handled as well as the entering and leaving wet and dry bulb temperatures of the air being handled to demonstrate that the conditioner is doing the correct amount of cooling. To check the tonnage, determine the exact amount of water used in gallons per minute, with the compressor operating at 120 pounds discharge pressure. Take the temperature of the inlet water and the outlet water to determine the temperature rise. Proceed as outlined in the example below:

$27^{\circ}$  temperature differential  $\times$  3 gallons of water  $\times$  the factor .086 = 2.91 tons.

### Starts and Stops Frequently

Attach a suction pressure gauge and discharge pressure gauge to the compressor and investigate the operation of the thermostat, low pressure control, and high pressure control.



## Conditioner Noisy

It is very difficult in many cases to determine the actual source of this condition. It should also be kept in mind that noise is relative and what is disturbing to one person may not be to another. The chief causes of complaints from noise are usually:

(a) *Belt*—The fan and motor pulleys must be in line and the belt must have the proper tension. A bent fan shaft, or marred pulley may cause noise.

(b) *Fan Bearings*—Improper lubrication or excessive belt tension may cause the fan bearings to wear excessively and become noisy.

(c) *Fan Shaft*—Too much end play in the fan shaft may cause vibration or allow the fan to rub the housing and can be corrected by properly spacing the collars on the shaft.

(d) *Loose Grilles or Panels*—All access panels and grilles should be tight and properly put in place.

(e) *Water Valve*—Under some conditions usually in connection with very low water usage or high water pressure, a water valve may be subject to a high pitched hum and if it cannot be corrected by adjusting the amount of water slightly, the water valve should be replaced.

(f) *Conditioner Not Level*—The conditioner must be leveled.

(g) *Weak Supporting Floor*—This can sometimes be remedied by placing a pad of isolation cork under the conditioner.

(h) *Relay*—(Single Phase) Chattering of this relay is usually due to low voltage, or poorly aligned contacts on the relay or magnetic starting switch. Low voltage may be due to the power generating or distributing equipment or to improper wire sizes.

The running contacts should be in line and about 1/16 inch from making when the hard rubber point is touching the bar containing the starting contacts. The contacts on the magnetic starting switch must be in line and not arcing. Never start the conditioner after a period of operation until the compressor has had a chance to unload, usually 1 to 2 minutes. Otherwise the relay may chatter. Normally, the relay will close only once on starting and the noise of the relay closing cannot be eliminated. If the relay continues to chatter, it must be replaced.

## Fan Will Not Start

Turn on the fan switch and investigate:

(a) *No Current*.

(b) *Protection Switch*—Check reset button and determine cause of overload.

(c) *Damaged Fan Motor*—Test for voltage at the fan motor terminals. If there is current and the fan motor will not start, the fan motor terminals must be investigated or the fan motor must be replaced.

(d) *Frozen Bearing*—Remove the fan access door and rotate the fan wheel by hand. If it cannot be turned, it may be due to the fan wheel striking the fan housing or a frozen bearing, and it may be necessary to center the fan wheel on the fan shaft or replace the fan bearings.

## REMOVING AND REPLACING PARTS

### Capacitor

To Remove the Capacitor:

1. Open the main disconnect switch.
2. Loosen or swing the control panel to one side.
3. Disconnect the wiring to the transformer and tag the wires for identification.
4. Remove the two bolts from the supports on the left side of the transformer. Loosen the two bolts on the right end of the transformer and slide the transformer to the left, away from the bolts.
5. Turn the transformer on the support plate and remove it.
6. Remove the metal strap at the right side of the capacitor support.
7. Move the capacitor to the right, into the space which was occupied by the transformer.
8. Disconnect the wires and tag them for identification.
9. Turn the capacitors on the support plate and remove them between the angle iron brace and the capacitor housing frame.

### Compressor

To Remove Compressor (in case compressor motor will not operate):

1. Attach a suction pressure gauge and close the suction and discharge shut-off valves on the compressor.
2. Remove the 1/8 inch pipe plug from the gauge adapter, attach a connector, (1/8 inch pipe x 1/4 inch flare) and run a 1/4 inch copper tube to a window.
3. Open the gauge adapter and discharge the Freon in the compressor until the suction pressure gauge registers 2 to 3 pounds.
4. Close the gauge adapter, disconnect the copper line, remove the gauge adapter and replace the 1/8 inch plug in the suction pressure gauge connection.



5. Remove the compressor as described in steps 6 to 15 inclusive, below.

To Remove (in case the compressor will operate):

1. Attach a suction pressure gauge to the compressor and close the liquid shut-off valve.

2. Close the discharge shut-off valve and then open it two or three full turns.

3. Block the low pressure control shut with a small wood block. NOTE: This is not necessary on 3-SCBX conditioners after Serial No. 2601.

4. Start the conditioner and operate it until the suction pressure gauge indicates approximately 15 inch vacuum. Stop the conditioner and quickly close the discharge shut-off valve.

5. Wait a few minutes, then observe the suction pressure gauge. If it indicates any pressure above 2 pounds, it must be "pumped down" again. If the gauge shows below 2 pounds pressure, open and close the liquid shut-off valve slowly until the suction gauge shows 2 pounds pressure.

6. Open the main disconnect switch.

7. Loosen the suction shut-off valve from the compressor body by taking out the four Allen screws.

8. Loosen the discharge flange by taking out the four screws. Provide a clean pan for catching oil in case lower drip pan is plugged.

9. Disconnect the high pressure control tubing at the discharge header.

10. Remove the compressor terminal box cover plate.

11. Disconnect the wires to the compressor motor terminals, tagging them for identification.

12. Loosen the connector at the compressor terminal box and pull the cable out of the opening.

13. Disconnect the two rubber hose from the top and bottom of the oil cooler.

14. Take out the cap screws in the top support plate and slide the compressor body forward. Place a piece of clean cloth in the suction valve opening and in the discharge flange opening in the compressor.

15. Lift out the compressor body and lay it on its side on a canvas or rubber mat until the new compressor is put in place, then place it in the new compressor shipping crate. NOTE: Do not rest the weight of the compressor on the conditioner drain pan and be careful to avoid damaging the floors or furnishings near the conditioner.

(To be continued)

## NEW FROSTOR REFRIGERATOR

(Continued from page 27)

the first really new refrigerator, combining seven cubic feet of cooling space with three and one-half cubic feet of frozen storage.

There are three kinds of cold in Frostor. The normal food storage compartment is kept constant at forty degrees. This compartment has 14.2 square feet of shelf space. The frozen food storage locker is maintained at zero. The ice making section, located between the two compartments, is kept at sub-freezing.

Entirely encircled by chilling coils concealed in the walls, also a departure from conventional designs, Frostor provides cold sleeve cooling which keeps air nearly 90 per cent full of moisture, thus eliminating dehydration and keeping vegetables crisp and fresh.

The inclosed coils also eliminate the necessity for frequent defrosting, this nuisance being almost entirely done away with. Defrosting of the refrigerator compartment never will be necessary.

## REFRIGERANTS

(Continued from page 30)

Power requirements are as low as for any of the other refrigerants, and lower than some.

To review, SO<sub>2</sub> makes an excellent refrigerant except for its large volume and certain hazards. The hazards it does have give instant warning due to its pungent, irritating odor. Because of its other good qualities, it has been widely used in domestic and small commercial systems. It was the first refrigerant to successfully replace ammonia in small size equipment. In this class of service the larger volume of sulphur dioxide is not a disadvantage, because of the small amount of refrigeration needed. A small compressor will handle sufficient of even this refrigerant to do the required job. Particularly with domestic units, it is an advantage because such refrigerants as ammonia produce so much refrigeration that it would be difficult to control accurately in the small quantities required.

But the toxic properties of sulphur dioxide have been against it. Methyl chloride and Freon 12 have largely displaced it in commercial equipment. Some manufacturers tried methyl chloride in domestic systems, later to give it up for Freon 12. Whether this latter refrigerant will entirely displace it in the future, time only will tell, but the trend is that way.

(To be continued)

# Warton School in England Trains Men of U. S. Army

A COMPREHENSIVE course in theoretical and practical refrigeration at the Warton American Technical School in England has attracted a student body of 124 enlisted men and officers of the United States Army, who intend to pursue the business in civilian life.

Only ten per cent of the enrollment are experienced refrigeration men, but many of the beginners have been trained in radio repair and they hope to combine the trades as their post-Army occupation. Three of the enlisted men are Negroes. Warrant Officer Harry M. Bailey, former refrigeration mechanic and serviceman for the Coca-Cola Bottling Company in Oswego, New York, who is serving as chief of the section at Warton, said that each student will be a qualified serviceman when he completes the study.

Mr. Bailey reported that each student is applying himself conscientiously and taking full advantage of the opportunities offered to utilize his time profitably while awaiting shipment to the United States for eventual discharge. Each "graduate" will receive a certificate of successful completion. "I know I wouldn't be afraid to hire any of them," Mr. Bailey stated confidently.

## 8 Weeks Course Offered

The course is only eight weeks in duration, but it is the equivalent of an eight-month semester in a vocational school in the United States. In the first six weeks the student tore down the compressor, condenser, receiver and cooling unit, and acquainted himself with each part under the supervision of capable instructors. He studied tube bending, flaring and pinch-off; made his own cooling coils, completed an installation on a work bench, charged and discharged the unit with gas, and installed the machine in a box. He also received lessons in multiple installations. The 80-hour week in the shop included two hours of classroom theory and four hours of practical work each day.

Then, during the final two weeks of the course, the soldier-students went "trouble shooting." Units were put out of order by

instructors and the pupils made the repairs after analyzing the mechanical disorder. The class also was segregated into eight groups which serviced refrigeration installations on the post.

The lesson plan is outlined as follows: Compression system, refrigeration installation, absorption system, conventional domestic compression of cycle-refrigerators, domestic rotary and hermetic compression of cycle-refrigerators, domestic absorption refrigerators, domestic automatic refrigeration controls, domestic refrigerator electric motors, domestic refrigerator servicing, refrigerator service shop and tools, commercial refrigeration installing and servicing, and refrigerants.

## Thoroughly Equipped

The course at Warton is based on a textbook entitled "Modern Electric and Gas Refrigeration," which was published by the United States Armed Forces Institute. The equipment, valued in excess of \$50,000, includes 18 units consisting of compressors, condensers and receivers; 18 units consisting of compressors, condensers, receivers and motors; 23 different types of household refrigerators as small as 4 cubic feet; 28 walk-in coolers as large as 216 cubic feet; 2 ice-flaking machines; spare parts, tools and equipment to maintain the units and for instruction. In addition, the section's machine shop is equipped with 2 lathes, 4 bench grinders, 2 drill presses and other tools.

The teaching staff consists of eight civilian technicians, who came to Warton directly from the United States, and four qualified enlisted men. Howard E. Degler, chairman and professor of the Mechanical Engineering Department, University of Texas, serves as co-ordinator of instruction. Among the civilian instructors are Thomas W. Poplin, Wilmington, North Carolina, veteran refrigeration service engineer, who has taught Army engineers for the last four years, and Joe B. King, Kansas City, Missouri, a distributor with 18 years of experience in the trade.

(Continued on page 37)

# A Trip Through Deep Sleep

**R**OBERT E. (BOB) SAUNDERS newly elected secretary of the Illinois State Association R.S.E.S. and engineer in the research department, Oil-O-Matic Corp., Bloomington, Ill., had just completed a very busy and highly successful year. What with the usual wartime difficulties of labor shortages, material troubles, long hours of work and little play made doubly hard because of the new position and its attendant responsibilities taken on about a year ago; and being elected secretary of the State R.S.E.S. group. Yes, it was a busy year.

Bob had done an outstanding job of his secretarial work, so much so, that he had just been reelected secretary for another year; he had won a promotion in the company by whom he was employed and his circle of friends had multiplied several times.

But Bob was tired as he sat in the meeting at Bloomington which earlier in the day had reelected him secretary. He had much to contemplate. A year ago he had been fresh and eager—but hard work will take its toll. He felt the need of rest—but in its stead—another year of the same thing lay ahead of him. Plans to be made, programs to map, reconversion, continued labor shortages, high prices and strikes to slow your efforts. If one could only go away and forget it all until everything had settled down.

Bob was watching a movie at the moment—a part of the meeting program he had helped to arrange. The meeting room was dark, his eyes smarting from the smoke laden air. The movie was a beautiful scene in color, of postwar expectations, so real in its portrayal that one could almost smell the flowers along the peaceful green countryside when suddenly looming into view came this sign:

*One mile to—*

## **DEEP SLEEP INC.**

Do you have troubles?

Don't you like the party in power?

Are you bored with things today?

Would you rather live 200 years from now?

Let DEEP SLEEP Help You

*See Attendant for Information*

The sign passed from view but its interesting message lingered. Such an intriguing thought and how appealing to those overworked harassed souls of these war years. Came another sign!

*One half mile to—*

## **DEEP SLEEP INC.**

Sleep with the famous

Enjoy life 200 to 2000 years from now

At our risk

Refrigerated Sleep that is Guaranteed!  
—or else!

*See attendant*

Another enticing thought! Apparently he was approaching the home of Deep Sleep Inc. Sleep! that's what Bob needed—sleep and rest. He had not had enough of it lately and here was an opportunity to get 200 years of it.

Approaching the building Bob entered and was met by an attendant.

"How do you do! Are you interested in Deep Sleep?"

Bob acknowledged he was.

"Deep Sleep," explained the attendant, "is an international institution founded for the purpose of preserving life for a future generation through the process of suspended animation."

"There are many of us who are dissatisfied with present conditions and who would welcome the chance to go to sleep—a peaceful undisturbed slumber—with the assurance that we would be awakened 200 or more years from now. Imagine all the conveniences and privileges one might enjoy—all the surprises which would be in store. Have you thought what it could mean to you?"

"Yes, I have," said Bob, "and just now I need sleep—a lot of sleep."

"You are now in the reception room of Deep Sleep, Inc.," continued the attendant, "and we would like you to make yourself at home with us while these beautiful young receptionists show you through the halls of Deep Sleep."

Bob had the vague feeling of floating through space as he was taken in hand by the receptionists. Their youth, charm and effeminate gentleness so much reminded him of the fleecy white clouds he once found time, as a boy, to watch floating across a clear blue sky. As they progressed one of the receptionists explained—

### The Halls of Deep Sleep

"These are the halls of Deep Sleep. The rows of doors before you lead to inner doors which lead to other inner doors and they to another and so on to the sealed chamber in which the guest sleeps, until awakened at a later date which he himself has specified. They are rooms within rooms, each insulated and soundproofed, shutting out the entry of nearly all heat and noise."

"But first you must be examined physically and mentally by our staff of doctors and psychiatrists, and we shall leave you in their care now."

With the examination completed Bob found himself in the registration room where the future date of awakening was recorded and the guest fee paid. He was now an official guest and about to start through the several processing rooms.

Beautiful nurses in white took charge of him now and placed him on a downy soft table, gently removed his clothing, then wheeled him into the aromatic room where induced relaxation permitted him to pass into a peaceful sleep.

Next, he was wheeled into the pre-sleeper where skilled physicians examined him again, and administered anesthetic to produce a deeper sleep.

He was then wheeled into the pre-suspension room where highly skilled technicians placed him on an automatic carrier which in turn carried him into the freezing chamber. Temperatures here were 250° F. below zero which freezes instantly and suspends animation completely. The carrier finally deposited him in the inner cell where the temperature remains at -250° without a fluctuation of more than 1/10 of one degree throughout the time of rest.

Time passes—200 years of it—and finally the specified date of awakening arrives. Conveyed into the tempering room his temperature is raised at the rate of only one degree per 12 hours for the first 250°, 2° per 12 hours for the next 20° and 4° per 12 hours up to 84° F.

The guest was then moved to the Electronic Pyrator where he was slowly heated

by electronic induction to 104° F. for a time specified by attending physicians who keep a constant check on reactions. As signs of returning life was evidenced, the guest was placed in the Inhalator to produce artificial respiration and the heart was started again by electrical impulses.

Consciousness begins returning and Bob is wheeled into the sun room. Nurses are in attendance now and they help muscles return to activity by gentle massages with aromatic oils. Voices in the distance come faintly to Bob's ears. They seem to approach nearer and nearer growing louder and more distinct. He shivers—awakes with a start.

Some one had opened a window. It was drafty—no wonder he felt cold—lights were on in the room again—the smoke had cleared from the air. The meeting was still going on but the movie had ended.

Phew! what a dream—lucky he had not been discovered sleeping—might have been embarrassing.

Our apologies to Bob Saunders for using him as the chief character in this story. The facts are that "Deep Sleep Inc." was Bob's idea which was rearranged and built up into the foregoing dream. We do wish that Bob had dreamed on a little longer so that we could learn something of that world of 200 years from now. We wonder for instance, what luck he would have finding an apartment to live in.—Editor.

\*\*\*

### WARTON SCHOOL

(Continued from page 35)

The school at Warton was opened on September 17 and a second course was scheduled to begin in mid-November. It was established on a former U.S. Army Air Forces base depot and sprawls over an area of 45 square miles between Preston and Blackpool in the industrial county of Lancashire. Warton "Tech" is one of three Army-sponsored centers of learning under the control of the Information and Education Division. The others at Shrivenham, England and Biarritz, France, specialize in academic training. The total enrollment at Warton reached almost 2,400 enlisted men and officers for the first course, but it is expected that 4,000 will attend the second course. Training also is offered in carpentry, welding, cabinet-making, surveying, drafting, painting and decorating, automotive and aircraft mechanics and other trades.

# SERVICE POINTERS

## *Practical Solutions of Your Service Problems*

**THIS** department is an aid to service engineers who are seeking new devices or methods to improve their work. All the service pointers have been supplied by the subscribers. **THE REFRIGERATION SERVICE ENGINEER** invites readers to submit "down-to-earth" practical service and installation information. Five dollars will be paid for each pointer published. Every service engineer has one or more "kinks" that have proved useful in every day practice. Here is your opportunity to exchange service pointers with the other fellow and earn \$5.00 for the information. Write up your idea today and mail it to the *Service Pointer Editor*.

### THE CASE OF THE OSCILLATING PUMP

**THIS** is indeed a sad tale. The chief character being a compressor. Not an ordinary compressor, mind you, rather one gifted with talents. In its younger days, it would perform its duties as required. It ran in a counter-clockwise manner, drawing deep breaths of sulphur into its body and expelling it savagely through the discharge valve. However, time marches on and after a few billion revolutions, say twelve or thirteen years worth, the discharge valve became weaker. It had pounded itself thinner and out of shape.

Now a very strange phenomenon took place which affected not only the entire refrigerators operation and ruffled the sweet disposition of the housewife, but baffled the best detectives in the refrigerating business! This strange phenomenon shall probably go down on record as the mystery of the oscillating pump.

At this point in order to hasten the story to a much more rapid and paper-saving conclusion, we shall refer to our records of the case—Number 5007: Name: Frigidaire. Approximate age: 13 years. Type: Low pressure control operated. Complaint: Short-cycles. Known previous history or service: Motor repaired several times.

General information: This short-cycle complaint had occurred twice previously in the past two years. On both occasions the motor was taken back to the shop for testing. The mechanics' reports were identical.

The machine short-cycled with the control lever at any position in about five to ten seconds. The queerest feature was the fact that as soon as it cut out, and during the off-cycle, it appeared that the motor made several immediate attempts to start. The brushes could be heard riding the commutator in successive stop and start movements.

On both occasions, the motor was removed to the shop for testing and in both instances the motor was returned untouched, as the tests bore out the fact that the motor, its windings, etc., were perfect!

### Still Short-Cycling

On the following day a report came in that the box was still short-cycling. "Pop" was sent out on the jobs. (In vaudeville, they say you are born in a stage trunk. Pop was born in an ammonia tank.) That is just to give you an idea of Pop's experience! The next day Pop's report came in:

Record 5007, Section 2:—Reference to the thirteen year old short-cycling Frigidaire: This job is a real humdinger. Soon as the box cut off I peeped inside at the unit and what do you think? I heard the funny sounds the brushes were making, then looked at the motor fan and saw it turn first half way in one direction, then turn in the other direction. It did this three or four times, then pifff! The unit cut in again! Then pifff, it cut out again! This time I noticed that just as the motor was rocking back and forth, the low pressure control contact arm lowered itself until it made contact, and—you said it—off again! So, I waited again until it cut out. This time I watched the pump and it, too, was rocking back and forth!

Now see here, boss, the system was checked. No restrictions. Refrigeration temperature perfect. Suction valve front-seated correctly to allow normal operation of control. Motor condition perfect! Suction O.K.! Pressure O.K. Belt—ah, wait! Something funny here. Belt very narrow. Hardly a wide enough Vee in it. Very queer. Very queer indeed. It cycled again. As soon as it cut out I slipped the belt off. It was very quiet, but the pump flywheel



continued to rock back and forth! In a few seconds it stopped. O.K. BOSS, I'VE GOT THE ANSWER! The discharge valve leaked!

Sure, while the pump was running, it managed to maintain the pressure. After a while the evaporator froze up, float stopped the suction line, pulled a vacuum and cut the unit out. As soon as the unit stopped, the high pressure gas in the condenser backed up through the discharge valve. So—when the gas backed up it lowered the piston, turning the flywheel. At the same time inflating the low pressure control bellows which lowered the contact arm. In the meantime, mind you, when the piston lowered, the suction valve went to work and allowed some accumulated back-pressure to enter the pump, reversing the piston action, in turn reversing the flywheel. Of course, that meant more gas in the pump, and the low pressure control contact arm lowered itself still more. By the time the pressures had equalized in the pump, the control had made contact and off it went again. The belt? Oh, yes. The belt was so narrow that it offered very little friction resistance at the pulley, making it easier for the pump to "oscillate." Submitted by M. G. Horwitz, Washington, D. C.

\*\*\*

#### "COLD POT" FOR COLD CONTROLS

A "COLD POT" used to set cold controls is a useful tool. I used a 2 inch piece of copper pipe scrap secured from a plumber's scrap pile. A disc was cut and soldered to the bottom of the copper tube. This tube was cut slightly longer than the depth of an old deep well cooker from an electric range, in which the tube was placed, and the cooker filled with mineral wool for insulation. Before installing the tube it was wrapped with five-sixteenths inch copper tubing as closely as possible and soldered to the tube. This made a good evaporator. I used an automatic expansion valve to meter refrigerant to the "cold pot" and the copper 2 inch tube was filled with Prestone. A solid top in the form of a funnel was placed over top of insulation and secured with tar to make an air tight seal of the insulation. I installed a thermometer holder permanently in the 2 inch tube made from one-half inch tubing with holes drilled in sides. When checking cold control I clamped the bulb of a dial thermometer to the cold control feeler bulb, so that when removing control bulb from "cold pot" the cut in tem-

perature could be checked as well as cut out. This makes for easy and quick adjustment of cold controls. Submitted by E. F. Rhodes, Wichita, Kan.

\*\*\*

#### TESTING GRUNOW UNITS

**L**EAKS—A leak test must be made before, or some time after, the system has been opened in order to allow all carrene in the air, not coming from the leak, to be cleared from the room.

Place the charging T in the liquid line and pump the system up to 50 pounds pressure, except the C unit, with the tire pump. Too much pressure will open the shaft seal on the C unit, so use about 15 pounds pressure.

Test for leaks in the usual way with a halide torch. Small leaks are hard to find with a torch. A small high side leak will let the carrene charge cut off the unit in time and a small low side leak will let air and moisture into the system. Sometimes a unit will work for two or three months or more before giving an indication that there is a small leak. Most call-backs are due to leaks, sludge, dirt or moisture in the system.

The best solution to a small leak problem, when the leak cannot be found with the torch, is to inspect every flare joint for cracks or corrosion and use oil or vaseline on the flares and threads when reconnecting the joints.

**ELECTRICAL TESTS**—If the unit will not run with the plug and overload switch in, test the thermostat by removing the relay box cover and short circuiting the two outside terminals. If the unit and fan runs, the trouble is in the thermostat; if only the fan runs, the trouble is in the motor, if nothing happens check the lead and plug. Watch the starting contact, no flash indicates an open capacitor.

**FAN**—A sluggish or inoperative fan with a good winding can usually be repaired by adjusting the air gap, washing out with gasoline and oiling with a light weight oil. Check fan for bent blades if it is noisy or vibrates. Submitted by C. L. Carter, Pueblo, Colorado.

\*\*\*

#### USE BROKEN EMERY WHEELS

**B**ROKEN pieces of emery wheels make fairly good wheel trimmers. The coarse grained hard wheels used to trim softer wheels are best.

# QUESTIONS AND ANSWERS

On Problems of Servicing, Installation and Maintenance of Household and Commercial Refrigerating Equipment—Send Your Problems to the Question Box.

## COMMENTS OF QUESTION 719

**I**N regards to Question No. 719, in the November issue, you are very likely wrong on the man's trouble with the Grunow Carrene Meter. The large carrene meter has been used for replacements on all models, and there is no difference in the capillary tube. The small meter was replaced, originally, because the small meter had insufficient capacity in the receiver, and if the capillary tube would plug up, the entire charge of carrene would back up through the condenser, filling it, and causing a high head pressure resulting in a burned out compressor. However, the performance of the two meters was the same.

There are two possibilities of trouble from the gentleman's description; one is that the compressor is worn, and the other is that the inlet screen is partially plugged up.

To check the compressor, warm up the unit by running, disconnect suction and discharge lines and attach a gauge directly to the suction fitting. I use a  $\frac{1}{2}$ " female to  $\frac{1}{4}$ " male flare fitting. The gauge should read not less than 28" vacuum. A good compressor will pull over 29" on an accurate gauge.

To check the inlet screen, which is under the check valve inside the compressor, disconnect the gauge and fitting and run the compressor. The air will rush out of the discharge port at a high pressure, and if it does not, check the screen.

One other possibility, that I find frequently on these Type "J" units, is the condenser being partially plugged at the outlet. I use a tank of CO<sub>2</sub> to blow out every one that comes in.—*F. E. Chambers.*

\*\*\*

## MONTGOMERY WARD PUMPS OIL

**QUESTION 720:** One machine that troubles me is a Montgomery Ward methyl, automatic expansion valve, universal compressor job that would slug oil ever so often until it would loosen the head bolts enough to lose the gas. I replaced the compressor with a new Kelvinator compressor. This helped some but still at longer intervals it will slug oil until one thinks it will break the valves. It freezes o.k., cycles o.k., and the

expansion valve is not erratic, although the suction line will either sweat or frost each time it cuts in. Is there too much oil in the system?

**ANSWER:** The symptoms you have described on the Montgomery Ward units indicates either too much oil or a leaking expansion valve. If an overcharge of refrigerant is present, then a leaking expansion valve will permit the evaporator to fill during the off cycle. I am inclined to believe the trouble is a combination of both these conditions.

\*\*\*

## UNIVERSAL COOLER TROUBLES

**QUESTION 721:** For the past year my duty has required me to service our division refrigeration equipment. Mostly the equipment consisted of walk-in coolers. The units were powered by four cylinder continental engines. I have in mind a problem for which I desire help. This is it:

It was a Universal Cooler Unit. Compressor, condenser, receiver, heat exchange (outside of box), expansion valve thermostatic, heat exchanger in evaporator compartment, solenoid valve, blower type evaporator, refrigerant (Freon) head pressure 150 lbs., back pressure 8 to 12 lbs.

The complaint was that the box under continuous operation would get no colder than fifty degrees. The sight glass in the liquid line showed bubbles and much foam when the receiver valve was closed. I added refrigerant, the bubbles did not disappear, the back pressure did not raise, the situation was not helped. I then decided that the foam in the sight glass was caused from too much oil mixed with the refrigerant. I pumped unit down and disconnected liquid line at the receiver. Opened receiver valves and let the refrigerant spray onto my hand. It didn't get cold enough to form a frost. The problem was licked. The trouble was that the boiling point of the refrigerant had been raised due to so much oil being mixed with it. (Does that happen often?)

Well, I blew the excess oil and refrigerant out of the system. Recharged the machine. The unit ran the following night continuously. The situation had been helped. The box went down to 40°. That's not cold



enough for the purpose of the box so the problem was not whipped.

A Detroit 673 expansion valve is located on the panel of the power unit. The line leading from the valve to the evaporator header never accumulates any frost nor does the evaporator. I disconnected the thermo bulb and warmed it in my hand. Immediately a frost back occurred (started at the heat exchanger). Well I then figured that the liquid line in the heat exchanger had sprung a bad leak and that the refrigerant was by-passing the coil and going right out the suction line immediately. I by-passed the two heat exchangers and the situation was still the same. Since then I have replaced the unit, but I am very much puzzled as to what was wrong with the unit just mentioned. Any ideas?

### A Few Additional Questions

Since I have written you this somewhat lengthy discussion how about the addition of a few questions.

1. Do bubbles in a liquid line sight glass ever mean air is in the system?

2. When is the proper time to check the superheat settings on valves in operation? I would use a thermometer immediately ahead of the valve and another thermometer at the end of the evaporator where the thermobulb was clamped. Right?

3. What superheat for forced draft unit coolers?

I appreciate the effort THE REFRIGERATION SERVICE ENGINEER is making to enlighten its readers.

**ANSWER:** Your problem on the Universal cooler installation is difficult to analyze without more complete data regarding operating pressures and the type of coil used, the size of line from the expansion valve to the coil and the diameter of the evaporator tubing.

You mentioned having blown the refrigerant charge in the condenser, but did you also blow the oil and refrigerant in the evaporator?

The explanation of the trouble leads me to believe that so much oil had accumulated in the evaporator that the pressure drop was excessive. This excessive pressure drop would act the same as a high super-heat setting and would starve the coil. Further evidence of an excessive pressure drop is in evidence when the valve bulb was warmed by hand. Evaporating at a low pressure would not take place until the refrigerant had passed through the coil.

It is quite possible that the compressor valves were not holding which would mate-

rially reduce its capacity. There is no reason why one unit would do the job better than another of the same capacity at the given evaporator temperature. You, no doubt, corrected the trouble when you exchanged the units although the trouble could have been in the low side rather than the high side.

Sight glass indicators will not show air in the system unless the refrigerant charge is below that which it should be. The air does not enter into a mixture with the liquid.

The superheat setting should be checked while the machine is in operation. This is necessary to get the actual conditions under which the valve is operating. A factory set valve will not necessarily maintain the same superheat when hooked to a coil for reasons given earlier.

Determining the superheat is a matter of comparing the pressure and temperature relationship of the refrigerant. This must be done because the back pressure (pressure drop) in the coil operates to close the valve along with the operating suction pressure. Thus, the pressure in the coil at the inlet is higher than at the outlet. The boiling point of the refrigerant at the coil inlet compared to the pressure-temperature relationship of the refrigerant at the coil outlet.

Forced draft coolers operate best with a 5 to 7 degree superheat. The setting of the valve will depend on the coil and compressor capacity balance; hence, no fast rule can be held on the valve setting.

### CARBON-TET IN SO<sub>2</sub>

**QUESTION 722:** I have been taking your magazine since 1935, and there is no question that it has been a great help. At times I still refer back to the 1935 issues.

This is the first opportunity I have taken to ask for some information. I am at a loss to know just what effect Carbon-tet will have on SO<sub>2</sub> if a quantity is left in the refrigeration system.

**ANSWER:** To our knowledge, carbon tetrachloride will have no damaging effects on sulphur dioxide. Both of these chemicals are relatively stable and therefore they should not cause any damage when mixed. I would not permit more than a trace of any foreign gas or liquid to remain in a system, however, before charging with the refrigerant.

If you have reason to believe that some carbon tetrachloride is in a system, I would suggest the system be completely evacuated.

# What Of The Future R

A recent Town Hall Meeting of the Chicago Chapter R.S.E.S. featured the opinions of four speakers representing four branches of the refrigeration industry on the above subject. Herman Goldberg presided over the discussions as moderator, introducing the

## FOR THE SERVICE ENGINEER

By P. B. REED\*

THE refrigeration service man has been doing a good deal of thinking about what is going to happen to him and his place



P. B. REED

in the refrigeration industry, now that the war is over. If he has continued in his work throughout the war he is looking forward to expanding his operations. If he has been out of the industry for a time engaged perhaps in other phases of war activity, he is thinking of just how he can best re-enter the industry and what particular niche he will fill in refrigeration. If he has been in the Army or the Navy, and has been working in refrigeration, he is probably looking forward very eagerly to getting back into civilian refrigeration. If he was a refrigeration service man before entering the service, but has not had an opportunity to continue with his trade in the service, he is very probably trying to decide whether to go back into refrigeration service, whether to enter sales or some correlated activity, or possibly he may be considering going to some other type of work. In addition to these there are numerous men who are just getting out of the Army or Navy who have had no experience in refrigeration, who perhaps were barely out of school when they entered the service, and who are attracted to the refrigeration industry.

(Continued on page 44)

\* Manager, Refrigeration Division, Perfex Corporation and Chairman of the Wartime Educational Board R.S.E.S.

## THE JOBBERS' VIEWPOINT

By JACK GLASS

THE refrigeration supplier, jobbing locally as well as nationally, is committed to have as many refrigeration part units as



JACK GLASS

possible at all times on his shelves in order to facilitate the services of the refrigeration service man to the ultimate consumer, the housewife, the merchant, or the industrial user of refrigeration.

It would be impossible for any independent service man to carry all

of the important parts in his own stockrooms and certainly it would be too costly a venture to attempt carrying all the items in the necessary quantities.

To the manufacturer the refrigeration jobber performs a necessary service in the way of warehousing all manufacturers' items which are available and channeling them to the best points of service distribution so that all manufacturers' parts can be given the best installations where they are most needed and where they will perform the greatest service towards the maintenance of refrigeration equipment.

In the past, the jobbers throughout the country have grown up from various sources because of necessity and the services which they could render to the service man as well as to the manufacturer. Today, these jobbers and their efforts are recognized by the manufacturers and by the service men to

(Continued on page 45)

\*Chairman of the Central Refrigeration Wholesalers Association.

# Refrigeration Service

S.E.S. speakers and conducting the question period following each talk. The four speakers and their opinions are presented on these pages. An appeal for continued cooperation and a unified effort coupled with a highly optimistic outlook was part of each speaker's address.

## FOR THE MANUFACTURERS

By K. B. THORNDIKE\*

IT WAS just about ten years ago when the Refrigeration Service Engineers Society had their annual meeting at Detroit. This



K. B. THORNDIKE

was quite an historic occasion for the reason that at the time of this meeting there was formed what is now the National Refrigeration Supply Jobbers Association and the Refrigeration Equipment Manufacturers Association.

Much of the credit for the formation of these important segments of the refrigeration and air conditioning industry should go to the late Frank Cockrell, founder of Electric Refrigeration News.

Since this Detroit meeting, the Refrigeration Service Engineers Society, the Refrigeration Equipment Wholesalers Association, and the Refrigeration Equipment Manufacturers Association have worked in close harmony and many problems confronting the industry have been successfully solved.

It is very doubtful if material for repair and maintenance of mechanical refrigeration would have been available during the war period had it not been for the close cooperation between these Associations, their membership, and their Executive Secretaries.

Practically all of the members of the Refrigeration Equipment Manufacturers Association have been engaged in war work, but at the same time and through the cooperation of the various agencies in Washington

(Continued on page 46)

\*Vice President, Western Regional Office, Detroit Lubricator Co., Chicago, Ill.

## AS IT APPEARS TO RSES

By H. T. McDERMOTT\*

THE refrigeration service business, in common with most other businesses, has come through a period of trying conditions with a record that they can be justly proud of.



H. T. McDERMOTT

We can reflect back now and consider what then seemed impossible. Shifts in civilian population, limited manpower, the imperative necessity for maintaining existing refrigeration equipment, and at times short supplies of essential parts and equipment, as well as other seemingly unsurmountable objects, appeared to be beyond solution. Yet withal, we find that the refrigeration service industry established a record that by comparison with other service industries, was so far ahead as to leave little doubt that the service and maintenance end of the refrigeration business was no longer a "necessary evil," but an integral part of the industry. As evidence of this record, reliable unbiased sources of information, which incidentally have been published in the daily press, show that 98 percent of existing refrigeration equipment was maintained in operating condition, as compared to a service record of 85 percent in the radio field. Not only did we face the handicap of lack of materials and manpower for our business, but it was a strange experience indeed to those of us who found it necessary to first sell the importance of refrigeration to the

(Continued on page 47)

\*International Secretary RSES and Publisher of The Refrigeration Service Engineer.

## For the Service Engineer

(Continued from page 42)

Those fellows who have engaged in civilian refrigeration service or other civilian activities during the war, have been working long hours, and some of them would like to take a little time off and rest up, but the probabilities are that very few will do so. The point is, however, that most of them have made very good money during the war, and have a very comfortable nest egg. Those who are now working for someone else are considering investing this money in going into business for themselves. Those who were already in business for themselves are considering expanding that business.

## Sales Will Be Good, But—

Shall they engage in or expand their activities to the sales field? Many refrigeration service companies that in the past have sold very little equipment other than an occasional replacement coil or condensing unit, and, of course, parts, refrigerant, etc., are now intrigued with the possibilities of selling freezers, household refrigerators, room coolers, and even store equipment. In their contacts with users they have learned which of these users' equipment is about at the end of its rope, and must be replaced. They have a very good idea as to which of these prospects can afford to replace the equipment. They know about what type of equipment this prospect will want to buy, and in by far the greatest percentage of cases they enjoy the confidence of the prospect and are in an excellent position to make the sale.

The service man today can undoubtedly sell a great deal of merchandise, at least within the next year or so. A lot of this business would almost fall in his lap, provided, of course, that he could make early delivery.

However, as time goes on the regular sales organization will get back into operation. The dealers will get their sales crews organized, and the inevitable effect of good merchandising methods and experienced salesmanship will begin to appear and show results. The service man must not think that all of these plums will fall into his lap. If he is to engage in the selling field, that is, if he is to actually become a dealer, he is going to have to adopt good merchandising methods. He is going to have to learn how to sell. He is going to have to learn how

to manage salesmen. He cannot expect to do his own service work and do selling also, except perhaps an occasional sale that he can pick up. A divided operation of this sort will probably lose him money, for he will probably lose time from his service work to make the sale.

Unless the service operator wants to go into selling enough to provide a nice, pleasant display room, have at least one man who gives his entire time to selling, and has arranged proper financial connections so that he can handle his "paper", he had better stay in servicing and make arrangements with some dealer to give him a commission on prospects that he will be in position to turn over to the dealer. This does not mean that a service operation cannot include a sales operation, but it does mean that if it is to succeed the service operator or service company is going to have to, in fact, become a dealer.

## Service Only for Some

After careful consideration many independent service operators are going to decide to stay out of the selling end of it and stick to their own phase of the refrigeration business. They are going to decide that they know the refrigeration service business, but they do not know the merchandising end of it, and they are going to decide that the service field also offers excellent opportunities, that the service business is a good, dependable business, that it is less affected by fluctuations in general business conditions than the selling end, and moreover, many service men are going to decide that they get more pleasure out of their service work than from sales work, and perhaps after a brief excursion into selling they will drop back to service only.

Many of the service operators who will continue as "service only," are looking forward toward enlarging their facilities, especially their shop facilities. Many of them found during the war that when it was difficult to obtain parts a well equipped shop would enable them to repair parts and use them, or even to make a few parts that are difficult to obtain, and quite a lot of fellows are considering the possibility of buying a small lathe, drill press, possibly even a surface grinder.

Some service operators are considering the possibility of going into the parts and unit rebuilding business. They see hermetic units becoming more and more common, not

only in household, but in commercial sizes, and they are considering the possibility of setting up and equipping a shop for rebuilding hermetic units, not for their own use, but for other service men. They see the possibility of using methods that have been developed in the last few years to enable them to salvage parts for obsolete types of equipment, for which the parts are not only difficult to obtain, but are quite expensive.

Industry has at last found the "putting on" tool in the metalizing process by which various types of metals can be sprayed from a hot flame directly on to the part, and in this way worn parts can be built up and resurfaced. Scored shafts can be reclaimed, even bearings, rods, and many other parts can be rebuilt, even though they may appear to be hopelessly worn.

### Hermetic Work Is Costly

A shop for rebuilding hermetic type units or open type units for others, involves quite a little investment, for it must be equipped with lathes, drill presses, grinders, bake ovens, welding and brazing equipment, and be provided with "dry air" under considerable pressure. For hermetic units a great deal of "know-how" is required, as well as equipment, and a well equipped shop must also be a very clean shop. This is the type of activity that must not be lightly engaged in, and the service operator would do well to very carefully investigate this field before entering upon it. Also, he should be sure that he will be able to get parts for hermetic units particularly.

The refrigeration service industry is much concerned with the returning veteran, many of whom will be coming back to the type of work they left, and probably back to the same shop in which they formerly worked. The veterans with little or no refrigeration experience will have to be trained. The service industry is aware of its debt of gratitude to the veterans, and is anxious to assist them in every way possible to get back into civilian life, into work that they like, and that will be profitable to them. The refrigeration service man through his organization, the Refrigeration Engineers Society, is nationally lending aid to veteran training programs. Locally, the chapters and individuals are giving their help to local educational programs. The industry needs more refrigeration service men, and as it expands through the tremendous sale of

home and farmer freezers, household refrigerators, room coolers, beverage coolers, and the many other refrigeration appliances that have been unobtainable for several years, and many thousands of which will be needed to satisfy this pentup demand, more and more service men will be required, not only to install this new equipment, but also to maintain and service the increasing amount of refrigeration equipment in the field.

In all, the refrigeration service man looks forward to the future with a great deal of confidence. He has gained stature during the war by reason of his ability to do a good job in maintaining the nation's refrigeration equipment under extremely adverse conditions, lack of manpower, lack of parts, and supplies, and working longer hours overtime.

He sees in the future new opportunities for service to the industry, and to the public, and he knows that he who renders good effective service to his customers at a price that is fair to both the customer and himself, will in the long run profit best.

\*\*\*

### The Jobbers' Viewpoint

*(Continued from page 42)*

whom they sell the various products of the trade.

Prior to the war the even flow of merchandise made it a relatively simple performance to furnish the various service organization needs. During the war the jobbers proved their worth to the service companies by having whatever materials which might be allocated by the various war boards at the right time for the service man's needs. In this way the jobbers performed a very capable job for the government and filled a merchandise need to the various users of refrigeration who were supplied valuable refrigeration repair services by the jobber customers.

The jobbers' relationship to the service man, as well as to the manufacturer, in the future, will be of greatly increased proportions. Many new developments which were just recently in the blue-print stage will soon be out. It will be the duty of the jobbers to introduce these new items to the trade so that they will be merchandised correctly. This service, in itself, will be of tremendous value to the service man as it will probably be impossible for the manufacturers to obtain trained refrigeration salesmen to cover



the entire country on all items, and I believe that it may be through the channels of refrigeration jobbers that the manufacturers will find the easiest markets to their consuming dealer trade.

It also stands to reason that when the many items which were not available during the war are again in production and are added to the items which will come out as new developments, the jobbers' services will be increased as might well be their individual enterprises. The cost of operating jobbing establishments is expensive and were it not for the experiences which most refrigeration jobbers of today have accumulated during the past few years, the job ahead for the refrigeration wholesale supplier would appear of too great magnitude. I therefore feel that the industry as a whole, whether manufacturer or service man, should recognize the use and need of refrigeration supply jobbers throughout the country, and give the necessary support where it is due.

### Past Activities

To summarize the above, I would like to mention the refrigeration supply jobbers activities during the past four years. Your jobber has tried to meet your requirements by ordering his merchandise as far in advance as his priorities would allow and also, by some means or another, supplying a substitute for material that was hard to get. There were times that your jobber was out of material essential to the jobs on which you were working. Most of you can understand and appreciate the circumstances. You know that it is our job to carry in stock everything that you require and as long as you are the buyers and we are the sellers you can rest assured that we will do our part by serving you to the best of our ability.

It will be recommended at the next Central States Refrigeration Supply Jobbers meeting that the local jobbers install a suggestion box in their stores into which you will be asked to drop constructive suggestions that will enable us to serve you better.

The jobbers resale policy will remain the same. It is outlined as follows:

- 1—He will not sell to manufacturing plants, hotels, and institutions where there are no service men.
- 2—He will not sell to service men employees of his customers to handle service work on the side.
- 3—He will not sell to any stranger unless he shows proper credentials and is actively engaged in the service business.

### For the Manufacturers

*(Continued from page 43)*

having to do with the allocation of material for refrigeration, a sufficient supply of raw materials and components were made available to—for the most part—maintain essential refrigeration throughout this country. Again, this means industry cooperation and coordination.

All of you have no doubt at times cursed your wholesaler and the manufacturer of refrigeration products for not having material when you wanted it or the right kind of material which you wanted. Please let me make it clear right now—this was certainly no fault of your wholesaler or your manufacturer. A war had to be won and Thank God—it was won!

Although it is too early to predict the new refrigeration and air conditioning product which is coming on the market, this industry is assured of a very substantial growth during the next few years. Much new product is coming on the market in the way of equipment, and new and—we hope—better accessory product is going to be available shortly.

It is unfortunate that labor strife is retarding progress on reconversion, but we must face the facts. Manufacturers are still having a great deal of difficulty in getting raw materials in sufficient quantities to produce the desired amount of refrigeration material; and in some cases, lack of material has actually held up finished product. It is hoped naturally that this will soon be over, but you must bear with us for a while longer before you are going to get exactly what you want, when you want it.

You may rest assured that we, as manufacturers of refrigeration equipment, are striving harder than ever to make more and better material available to you at the earliest possible moment, so please be patient and don't ask or expect the impossible.

### The Industry Show In '46

Although no official announcement has as yet been made, what will probably be the largest Refrigeration Show in history is being planned for the week of October 27th, 1946, at the Cleveland Auditorium. This All-Industry Show will be sponsored by the Refrigeration Equipment Manufacturers Association, but for the 1946 Show the Frozen Food Locker Manufacturers and Suppliers Association are joining with us to make it a really great Show.

Your Society is having its annual meeting in Cleveland at the time of the All-Industry Show and it is hoped that many of you will be able to participate in what we know will be the biggest Refrigeration Show in history.

If we can continue the cooperation of these organizations as we have been doing during the last ten years, there is no question but what it will make for a better industry. It is hoped that the industry problems that now confront us will soon be solved and that in the very near future we will be able to go full steam ahead.

\*\*\*

### As It Appears to RSES

*(Continued from page 43)*

various alphabetical agencies in Washington. Your national association, in cooperation with the jobbers and manufacturers found it necessary to do an elemental selling job to those we had presumed were fully cognizant of the vital necessity of refrigeration as a war tool. It was not an easy job and much credit must be given to these associations who presented a united front in the interest of the service field.

This cooperation brought about a better understanding as to the interdependence of each of our groups upon the other, and should reflect to our mutual advantage in the days ahead.

The jobber is an important link in the economic distribution of the commodities we need in our business. His investment makes it possible for us to give the service that has and will continue to expand our business. He is a member of our team.

Without the manufacturer you and I wouldn't be attending meetings of this nature and endeavoring to learn whether refrigeration is going to offer us the possibilities we want for future security. So, too, the manufacturer is a member of our team.

As to the future prospects of the jobber and manufacturers without an efficient and capable field organization of service men and organizations such as most of you men represent—I'll let you answer that one. So you see there is a close mutuality of interests that must be recognized. I like to compare these three interests to the old-fashioned three legged milking stool—kick one leg out of our stool and someone is going to find themselves in an awkward position.

I do not believe there is a comparable period in the history of refrigeration that has

emphasized the importance of the service man than the past three war years. He has advanced himself to a position of importance and recognition. His job should not be quickly forgotten, but right here we face an important decision as to what advantage we are going to make of our hard earned position.

It must be remembered that during the past three years the service man is practically the only one in the refrigeration industry that has maintained an uninterrupted customer contact. With no equipment to sell, sales personnel were of course diverted to other types of work.

### Serviceman's Position Recognized

All through this time, the user of refrigeration equipment recognized that the service man was the one point of contact in the refrigeration field who must be depended upon to keep equipment operating. I am sure that many of you know from your own experience that when consideration is given to new equipment, your recommendation will in all likelihood carry considerable weight in the final selection of such equipment. I might say, in passing, that manufacturers of refrigeration equipment also recognize your position in respect to future sales. Whether you operate your own service organization, or are employed as a service man, I can conceive of no better way of emphasizing your position today than the statement recently made by the director of service of one of the country's largest national refrigeration equipment manufacturers. I quote him verbatim: "Independent service companies have become a real factor in refrigeration. They are a recognized part of the distribution system and will become of increasing importance if they recognize their responsibilities. Many service companies who have contracted with a seller of a product to handle all service, have realized that they have an obligation to protect the good name of the seller and the product, and also realize the only way they can expect to grow is by conducting their business along lines of fairness to the user, the seller, the product and themselves. The results have been that these service companies have grown very rapidly, and have become recognized as good sound business men and highly respected in their communities.

Because of the nature of our business, our average individual operations are small. In many ways I believe this to be an advantage. However, this may have a tendency



"FRACTIONAL TONNAGE  
 VALVES FIT LOW  
 TEMPERATURE WORK  
 WITHOUT HUNTING  
 OR STARVING...!"



**REFRIGERATION MAINTENANCE CO.**  
 PHONE FAIRCHILD 3-2800  
 2741 UNIVERSITY STREET  
 CHICAGO, ILL.

especially on low temperature  
 work. We like the frac-  
 tonnage...

**EXPERIENCED REFRIGERATION SERVICE**

## EXPERIENCED REFRIGERATION SERVICE

Engineers like Mr. A. L. Robertson, of the Refrigeration Maintenance Company, Madison, Wis., give full credit to "A-P Dependable" Refrigerant Valves for their special adaptation to low temperature work. They find that "A-P" fractional tonnage sizes for Freon or Methyl Chloride refrigerant applications make it easier, as Mr. Robertson states, to fit the job without necessity of "hunting" or "starving" the line.

Offering a wide range of adaptability, any standard A-P Refrigerant Valve can be used on Air Conditioning, Commercial Temperature and Low Temperature work without special attachments or without changing valves. Thus one standard A-P Valve fits a variety of applications.

Write for Illustrated Bulletins covering A-P Refrigerant Valves.

## AUTOMATIC PRODUCTS COMPANY

2454 N. 32nd Street, Milwaukee 10, Wis.  
Export Dept. 13 E. 40th St., New York 16, N. Y.



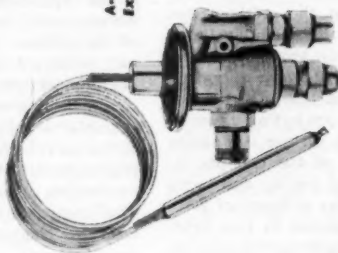
# DEPENDABLE Refrigerant Valves

Stocked and Sold by Good Refrigeration Jobbers Everywhere - Recommended and Installed by Leading Refrigeration Service Engineers

Especially on low temperature work. We like the fractional tonnage sizes because we can better fit the job without hunting or starving.

Yours very truly,

*Achie*  
A. L. Robertson



A-P Model 205 Thermostatic Expansion Valve. Capacity, up to 1 ton Freon.

toward creating an inferiority complex about our position in the industry. Let's dismiss that type of thinking in a hurry.

I think that this is a good time to learn just how small or how large is the business we represent. In a recent survey it was shown that approximately 60 percent of the service companies were operating with two or less employed men, and this figure increased to 80 percent when we consider service companies operating with three or less men. Certainly no one can deny this can be considered small business as businesses go.

The Government in its Census of Businesses, made a survey of the refrigeration service industry back in 1989, and included in their classification only those refrigeration service companies that were operating as independent establishments. On the basis of those figures and projecting them to include some 10,000 such service companies operating, the aggregate of the receipts involved in both the sale of service and parts and equipment, approaches a figure of \$70,000,000 annually. Considered in this light, this is far from small business and capable of supporting many large industries in our country.

### Future Position

So much for our present position. The question which concerns us most is—what of the future? The question is often asked, just what is going to happen to service with the continuing advancements being made in manufacturing methods, and the increasing application of the hermetically sealed compressor. To give a brief answer, I am of the opinion that some service men have been unnecessarily concerned about a situation that, rather than reduce business for the service man, will, to the contrary, have a tendency to make more and better business for those individuals, providing that they can recognize the future possibilities and be so equipped by experience and vision to accept the additional responsibility that is sure to come.

With all due respect to the fine work that manufacturers have done in perfecting precision methods of manufacture, there is no mechanical equipment produced subject to everyday operating conditions that does not require occasional mechanical attention. We have not arrived at the age of perfection and I am sure that universal use of fool-proof atomic energy is something for the next generation to concern itself about.

Just as the service field has come a long way during the past ten years, there is nothing that can stop an accelerated progress during the next decade, but we must be alert to changing conditions and be in a position to take advantage of these changing trends.

### Will Need More Knowledge

The service man of the future is going to be much more than merely a repair mechanic. He is going to find it necessary to know more than just the repair or changing of an expansion valve, a control, or a condensing unit, or any other component part of the system. He is going to find it necessary to have a broader knowledge of the application of refrigeration equipment in a diversified number of uses. Let's take, for example, a subject of current conversation as far as refrigeration is concerned—that of frozen foods. We are going to see a large production of home and farm freezers manufactured, many of them by the old line established companies, and quite a number of manufacturers who are newcomers in the field who feel they can secure a part of this business. I venture to say now that a majority of the service calls will not be the result of the failure of the equipment, but the lack of knowledge by the user as to what the refrigeration equipment is designed to do. As usual, the service man will be required to rectify some of the mistakes that the over-enthusiastic sales department is bound to make. It is quite conceivable that among the many qualifications necessary for a good service man, he may find it necessary to add that of food specialist. Looking at the commercial side of the picture, nutrition specialists tell us that food processing requires refrigeration from the time of actual harvest until it reaches the ultimate consumer. Portable refrigerated food processing machines in the field, refrigerated transportation to storage centers, thence to wholesale distributing points and retail outlets is going to require considerable refrigeration. Who is going to be responsible for maintaining this refrigeration equipment?

What of the many new industrial applications that have resulted from our experience in war production. This is the type of equipment that is going to require the services of experienced service men, and incidentally, is going to make a profitable commercial business. Sub-zero chilling for testing purposes and treating metals, for example, will be one critical application. Sat-

ified customers among these classes of users can establish an enviable position for the community service man.

Some of the figures that have been given out for refrigeration are staggering. They seem difficult to comprehend. At times one is concerned whether the industry will have enough productive capacity for years to come to answer all of the demands that the public is going to make. Here is a forecast made exactly two weeks ago as regards air conditioning: The statement has been made by an economist, a member of a large New York financial institution. He claims that the demand for air conditioning should represent a market of one and one-half billion dollars worth of business within the next five years. His report reveals that air conditioning has gone further in the ten pre-war years than domestic refrigerators, radios, washing machines, electric ranges and automobiles went during their comparable period of growth.

### Air Conditioning

Only 3 percent of department stores, 3 percent of doctor and dentist offices, 2 percent of bank establishments, 2 percent of drug stores, 6 percent of restaurants, 4 percent of beauty and barber shops and 5 percent of hotels are air conditioned today.

As to the popularity of air conditioning, this economist says "air conditioning in every home" is obviously a more likely objective than "an aeroplane in every garage," and hotels in the future will advertise "all rooms air conditioned" instead of "all rooms with private bath."

From another angle of the future of our service business, let us look at such standby commercial customer users of walk-ins, reach-ins, bottle coolers, beer dispensers, display cases, milk coolers, etc. One manufacturer of such equipment, not a large one at that, has reported that one of his Ohio distributors operating in four towns of a quarter million population each, has placed an initial order of some 1500 units representing an amount of \$565,750.00, with the statement that his market will absorb many more units in the first postwar year. Some service company is going to make these installations.

Here is what another good commercial customer of the service man needs—in fact, considered the third largest retail trade—restaurants. Ultra conservative estimates place the number of individual restaurants

at 88,000. The National Restaurant Association made a sample survey to 1,010 restaurants, and according to returns each was planning to spend an average of \$1800 as soon as equipment was available. The major items of expense listed included: \$250.00 for dishes, china and glassware; \$123.00 for silverware; \$50.00 on appliances, toasters, juice extractors, coffee brewers, etc.; and get this \$370.00 for refrigeration to include overhauling and new equipment.

In the face of the foregoing facts and the necessity to not only install, but maintain all of this equipment as well, should the refrigeration service man concern himself with the question of his future, but rather are we ready to maintain the accelerated pace of the industry and qualified to accept the additional responsibilities that will be ours.

I merely mention the above instances to show you from actual experiences what the postwar market is going to be, and in an effort to dispel any doubt in your mind as to the future of the service business.

### The New Men in the Field

I think we should be reasonably concerned with getting the right caliber of men started in the business because it seems apparent they will be needed. Here again, too, many service men often spent a good part of their time on thinking in terms of too much competition in the business. Competition is what we make it. It can be either good or bad. If it is the opinion that it is easier to meet competition by dropping to the level of poor competition, I am afraid there is little hope for the individual operator who adopts such practices. On the contrary, if we go out with the objective of establishing our business on a legitimate basis, to give a guaranteed service with a fair return, I am equally confident that that service organization is going to enjoy the success they deserve.

Right here, I would like to point out that many men in the Armed Forces have been encouraged by the outlook of the refrigeration industry. A number are thinking in terms of selling equipment, while a large percentage being mechanically minded are interested in the installation, maintenance and servicing end of the business. We have a responsibility in seeing that these men are correctly guided in our field, and your local chapter can accomplish much good in this direction.



VIEW OF THE LUNCHEON MEETING OF SOUTHWEST JOBBERS

#### SOUTHWEST JOBBERS MEET

**T**HE annual meeting of the Southwest Refrigerator Equipment Wholesalers Association was held November 20, in the Baker Hotel, Dallas, Texas. Closed meetings were held in the morning and afternoon and at noon the jobbers invited manufacturers and their representatives to be their guests. There were 27 jobbers and 22 from the manufacturers group attending the luncheon. Two additional guests were H. R. McCombs, President, and H. S. McCloud, Executive Secretary for R.E.W.A.

Mr. Joe Mideke, Mideke Supply Company, Oklahoma City, Oklahoma, presided over the group. Officers who were elected at the meeting are: Chairman—Burl Boykin, Jr., Standard Brass and Mfg. Company, Beaumont, Texas; Vice Chairman—Alex Trevino, United Refrigeration Company, San Antonio, Texas; Secretary-Treasurer—R. J. McBrien, Electromotive Company, Dallas, Texas; National Director—Joe Mideke, Mideke Supply Company, Oklahoma City, Okla.; Executive Committee—Frank J. Walters, Walter Refrigeration Supply Company, Houston, Texas; Roy O'Hale, Motor Supply Company, Monroe, La.; Sydney A. Gaines, United Electric Service, Wichita Falls, Texas; K. G. Wight, K & M Supply Company, Tulsa, Oklahoma.

#### R.E.M.A. FALL CONFERENCE ATTRACTS RECORD ATTENDANCE

**T**HE members of the Refrigeration Equipment Manufacturers Association met in Hot Springs, Va., November 7, 8 and 9 for their usual Fall Conference. Subjects covering O.P.A. regulations, reconversion, market surveys and other pertinent matters provided an interesting three day program.

The first day of the conference was devoted to meetings of the 10 product groups which comprise the REMA membership. On Thursday, President F. J. Hood, Marinette, Wis., introduced as the first speaker, Mr. Fred Schwarz, head of Mechanical Building Equipment Section, Building Materials Price Branch, O.P.A., who informally discussed the subject "O.P.A.—It's Price Regulations for Reconversion and Postwar." In his talk, Mr. Schwarz outlined the procedure that O.P.A. has adopted in adjusting manufacturers prices.

Vice-president Herman Spoehrer, St. Louis, Mo., in introducing Mr. Theodore Sills, Public Relations Counsel for the Association, stated that the Directors had considered favorably the continuation of the program and that the membership would participate on a voluntary contributing basis in

These nationwide  
**"FREON"**  
 advertising campaigns



## help sell air conditioning and refrigeration

Year after year powerful "FREON" advertising campaigns appear in leading publications read by architects, engineers, food manufacturers, locker plant operators, business executives, store owners and the general public. These campaigns do an important job of selling.

In *TIME*—the weekly news-magazine—"FREON" advertising reaches more than 2 million men and women in all kinds of businesses and industries.

In *ARCHITECTURAL RECORD* and *PENCIL POINTS*, another "FREON" campaign features air conditioning installations in buildings that have been planned for the future. These messages provide architects and engineers with ammunition to sell modern systems to their own clients.

In *FOOD INDUSTRIES*—a leading periodical catering to food manufacturers—more "FREON" advertising stresses the benefits and value of air conditioning and refrigerating systems to many different types of food processors.

In *QUICK FROZEN FOODS*, a series of "FREON" advertisements shows outstanding locker plants in various sections of the country. Operators are being made conscious of the advantages of modern equipment and "FREON" refrigerants.

All this advertising is aimed at helping to sell more air conditioning and refrigeration . . . it's helping to build business for you. For complete information about "FREON" safe refrigerants, write: Kinetic Chemicals, Inc., Tenth and Market Streets, Wilmington, Del.

"Freon" refrigerants are now available in unlimited quantities for comfort cooling, refrigeration and other uses.



any amount from \$250 to \$1000, as formerly. Mr. Sills reported on the work that had been done since the REMA public relations program was adopted covering a period of the past six months. A brochure was distributed to each member showing the type of publicity that had been secured.

Mr. F. K. Zimmerman, Defiance, Ohio, presented a comprehensive report on the accomplishments of the credit committee of REMA and the progress that has been made during the past several years, as well as plans for its expanded program in the future. Each year has shown a growing number of participating companies in this program.

Mr. K. B. Thorndike, Chicago, Chairman of the All Industry Exhibition Committee, reported briefly on arrangements for the All Industry show in Cleveland in October, 1946.

Arthur O. Beamer presented a paper on the refrigeration market in South America based on his experiences during a recent trip to the Latin American countries.

Mr. W. K. Maxwell, Detroit, was the first speaker at Friday's meeting. His paper "Control and Operation of a Field Sales Force" included an analysis of sales expense.

A formal report was presented by Mr. George Allen, Pittsburgh, Pa., on the subject of jobber relations and problems. The subjects suggested are to be considered in a joint REWA-REMA committee meeting.

Mr. Gene Robers, Cleveland, Ohio, covered a number of subjects pertaining to advertising programs in his talk "How to Work Out a Postwar Advertising Program."

The program concluded with two interesting papers. Postwar sales possibilities by E. F. Censky, Dayton, Ohio, "American Industry Looks Ahead," was a forecast based on the survey recently compiled by the Committee on Economic Development. "Analyzing Salesmen by Aptitude Tests" was presented by Dr. M. Fleming of the Klein Institute of New York, who briefly outlined the aptitude testing method in the employment of salesmen and other personnel.

\*\*\*

## NEW ADVISORY COMMITTEE HOLDS FIRST MEETING

THE newly appointed Compressor and Condensing Unit Industry Advisory Committee held its first meeting December 6 in the Cleveland Hotel, Cleveland, Ohio, according to the Office of Price Administra-

tion. Represented were manufacturers of compressor and condensing units up to five horsepower—parts used in the manufacture of industrial and commercial refrigeration units, OPA said.

Compressors and condensers already are in production, with prices set on an individual firm basis. But a number of firms have not yet applied for reconversion price adjustments, and the advice of an industry committee is needed to complete the job of pricing, OPA said.

The first three members listed below were members also of the Compressor Industry Advisory Committee appointed last year and now superseded by the new and more widely representative committee.

Members are: B. J. Scholl, Brunner Mfg. Co., Utica, N. Y.; Frank Gleason, Copeland Refrigerator Corp., Sidney, O.; Frank Smith, Tecumseh Products Co., Tecumseh, Mich.; Harry Pendergast, Lynch Mfg. Co., Defiance, O.; Sterling Smith, Baker Ice Machine Corp., Omaha, Neb.; George S. Jones, Servel, Inc., Evansville, Ind.; W. F. R. Karsten, General Electric Co., Bloomfield, N. J.; H. F. Hildreth, Westinghouse Electric Co., Springfield, Mass.; Harry Hedrick, Mills Industries, Chicago, Ill.

\*\*\*

## BOOK REVUE

LESSONS IN ARC WELDING, Seventh Printing, second edition, published by The Lincoln Electric Company, Cleveland, Ohio, 176 pages, 5½ x 8½ inches, 133 illustrations, including photos and drawings; cover, semi-flexible simulated leather, gold embossed; price postpaid United States 50 cents per copy, elsewhere 75 cents per copy.

"Lessons in Arc Welding," is a revised and up-to-date new printing of the second edition to assist both new and experienced welders as well as all persons interested or concerned with the subject, with complete and thorough instructions in all phases of arc welding.

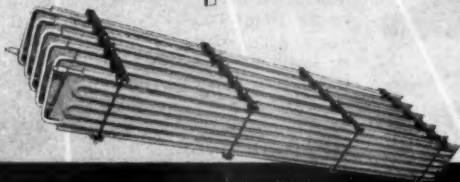
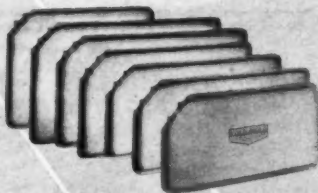
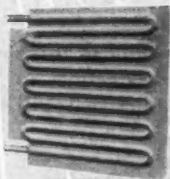
The book includes 61 lessons in arc welding and has over 200 photos and illustrations to supplement the text. From the very first paragraphs dealing with "Instructions to the Operator," to the 571 examination questions and answers given in the closing pages, the book sets forth in plain simple language, the practical instruction based on the experiences of Mr. Arthur Madson, head instructor in the Lincoln Arc Welding School.



# KOLD-HOLD LOW SIDES

## HAVE APPLICATIONS *Unlimited*

For locker plant space cooling, for shelves and stands in sharp freezing, or as cabinet liners, Kold-Hold Quick-Action Serpentine Plates, either wall mounted or in ceiling banks, have no equal in efficiency and dependability. In truck refrigeration, Kold-Hold streamlined "Hold-Over" Plates maintain the temperature of delivery truck bodies at the uniform level necessary in the successful transportation of fresh meat, ice cream and frozen foods. Specify Kold-Hold Low Sides for the most modern, efficient and economical method of refrigeration. Write today for complete data and engineering assistance.



**KOLD-HOLD MANUFACTURING CO.**

502 N. GRAND AVE.

LANSING 4, MICHIGAN

# Season's Greetings

AT THIS season of the year a grateful nation pauses from its labors to give reverent thanks for its first peacetime Christmas since 1940, and to affirm its faith in the fundamental principles of freedom, lighting the whole world without the obscuring cloud of hate and prejudice.

To our R.S.E.S. Members everywhere—at home, and to those still serving their country—we send these Holiday Greetings to you and yours, with the fervent hope that the coming year will bring you much joy and happiness.

H. T. McDERMOTT, <i>Secretary</i>	C. BUSCHKOPF, <i>Acting President</i>
S. B. GARLAND	W. W. ALLISON
C. J. DOYLE	J. K. BUSH
W. MARSHALL	J. L. DRISKELL
E. A. SUMMER	P. B. REED
	W. W. FARR
	A. D. MCGILL
	A. M. PALEN

## COMING CONVENTIONS

**RSES Convention**  
Place: Hollenden Hotel.

City: Cleveland, Ohio.

Date: October 26, 27, 28, 1946.

Secretary: H. T. McDermott, 433 N. Waller Ave., Chicago 44, Ill.

**REMA Meetings and Convention**  
Spring meeting: March 4-5-6-7, 1946.

Place: Stevens Hotel, Chicago, Ill.

Joint meeting with jobbers.

**All Industry Exhibition:**  
Place: Cleveland Public Auditorium.

City: Cleveland, Ohio.

Date: October 28-29-30-31, 1946.

Exec. Secretary: R. Kennedy Hanson, 1107 Clark Bldg., Pittsburgh, Pa.

**REWA Meeting**  
Date: March 4-5-6, 1946.

City: Chicago, Ill.

Exec. Secretary: H. S. McCloud, 920 E. McMillan St., Cincinnati 6, Ohio.

**ASHVE 52nd Annual Meeting**

Place: The Commodore.

City: New York, N. Y.

Date: January 28-30.

Secretary: A. V. Hutchinson, 51 Madison Ave., New York 10, N. Y.

## NEW CHAPTERS IN THE MAKING

### Fresno, California

AT A regular meeting of the Refrigeration Service Engineers Association of Fresno, California, held October 8th, it was unanimously agreed that this organization associate itself with the Refrigeration Service Engineers Society and apply for a charter forming a local chapter. At a meeting held November 11th under the direction of W. W. Allison of Los Angeles, the petition for a charter was signed by 28 applicants for membership and forwarded to the International office. The official meeting date of the group was set for the second Thursday of each month. Granting of the charter is now under advisement of the International Board of Directors, and is expected to be acted upon in the immediate future. Temporary officers now serving the groups are: A. H. Brundage, *President*; Ed. Stebbins, *Vice President*; Nat N. Leas, *Secretary*; and C. W. McColm, *Treasurer*.

### Greensburg, Pennsylvania

Sixteen men in Greensburg, Pennsylvania, and the surrounding area met and petitioned the International office of the Re-

# *Increased Diaphragm Life* **PROLONGS THE SERVICE LIFE OF THE VALVE**

Our TRIPL-SEAL DIAPHRAGM VALVES are constructed upon a new and revolutionary principle involving a minimum of movement. The greatly increased multiple diaphragm is never deflected past its normal center; thus giving it much greater service life. It provides positive sealing at three essential points. The valve has positive and easy closing provided by a single turn of the hand wheel.

Body and cap are of seepless forged brass; maximum mounting strength is provided.

Valves are furnished in two way and angle type—flared or solder type ends, and a complete range of all necessary sizes.



**MUELLER BRASS CO.**  
Port Huron  
Michigan

refrigeration Service Engineers Society in June of this year for a charter to form a local chapter. Several formative meetings were held with the first official meeting being held September 25th. On August 4th at a dinner meeting the officers were formally introduced and installed. They are: Joe Curry, *President*; Joe Michaelson, *First Vice President*; Ted Eisaman, *Second Vice President*; Merrill Allen, *Secretary and Treasurer*; Ralph Wesling, *Sergeant-at-Arms*; and Joe C. Hipps, *Educational Committee*. Board of Directors are R. E. Eisaman, *Chairman*, Bob Miller and Don Fisher.

### Fairfield County, Connecticut

Men from all parts of Fairfield County gathered recently and resolved to apply for a charter under which a chapter of the Refrigeration Service Engineers Society could be formed. Thirty-four men signed the charter application in October, which was then presented to the International Office.

### Waterloo, Iowa

An application for a charter signed by thirteen men in the vicinity of Waterloo, Iowa, was signed and presented in August of this year. The proposed name of the chapter will be Cedar Valley. Several meetings have been held to date and the chapter has thirty-two members whose names are inscribed on the charter.

On November 28th, Clarence Buschkopf, Acting International President, presented the charter to the chapter.

### Tampa, Florida

A meeting of refrigeration men in Tampa, Florida, and vicinity was held in the month of November for the purpose of considering the formation of a chapter. In attendance was International Secretary, H. T. McDermott, who explained the benefits to be derived from membership and the formation of a chapter.

### Charleston, West Virginia

Thirty men of the Charleston area made formal application for a Charleston charter in the month of September of this year. Since that time several additional men have signed membership applications and granting of the charter is now being considered by the International Board of Directors. Temporary officers elected are Harry G. Frame, *President*; L. E. Von Woglon, *Secretary*; and V. K. Gaskins, *Treasurer*.

## R.S.E.S. Chapter Notes

### ROCKFORD CHAPTER

*Rockford, Ill., Nov. 5*—The election of officers was held on this date with the following results: Henry Genin, *President*; E. McDermott, *First Vice President*; E. T. Reynolds, *Second Vice President*; Robert Weygant, *Recording Secretary*; Earl J. Seaton, *Corresponding Secretary*; Harry Lundholm, *Treasurer*; E. M. Cassidy, *Sergeant-at-Arms*.

The Rockford Chapter is now in the process of rebuilding interest and activity and bids fair to be bigger and better than ever. On November 5th a buffet luncheon was served for members and visitors with 34 people in attendance.

### TOLEDO CHAPTER

*Toledo, Ohio, Nov. 14*—Six new members were accepted to membership at this meeting. They were: Max Scott Bonin, Lawrence Richards, Oscar Little, Don Wagoner, Ed Mulligan and Leo Davison.

A business discussion occupied part of the evening during which it was decided that the proposals of the Lincoln Life Insurance Company would not be accepted. The door prize was won by L. Davison. The feature of the evening was a movie presented and explained by Major Ted Frome of the United States Army Troop Transport Command. The movie was both entertaining and instructional.

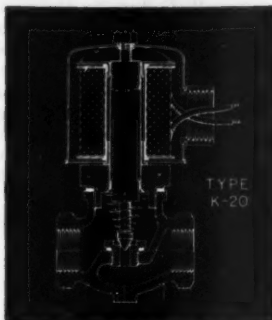
### LONG BEACH CHAPTER

*Long Beach, Cal., Nov. 19*—Before the meeting, the fifty members and five visitors present enjoyed a luncheon served by the eats committee: Ed Murphy, Earl Langston, R. Bunker and R. J. Sexton.

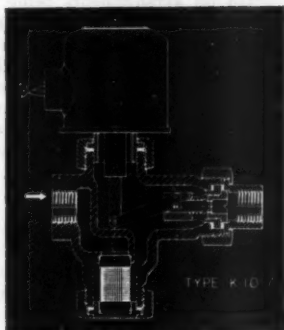
Two speakers placed important matters before the members. One of these was Mr. Leo Gable of the Long Beach City College, who spoke on apprentice training and made a proposal to the chapter that recommendations be made in order that an adequate program may be set up. The other speaker was W. W. Allison of Los Angeles, who as a member of the national board of directors, gave a report of that board's meeting and also presented the tentative plans of a state organization. The members voted unanimously to join with the other six California Chapters in forming the association.



Type V-200



Type K-20



Type K-10-7

# Refrigerant Valves

**Freon, Methyl Chloride,  
Sulphur Dioxide, Ammonia**

## ★ V-200 THERMAL EXPANSION VALVE

Unsurpassed sensitivity and dependability. Factory set superheat at 10°F. External adjustment. Internal equalizer. External bulb. 5 ft. capillary. Bulb clamp adaptable  $\frac{3}{8}$ " to  $\frac{3}{4}$ " O. D. tubing. Integral filter. Wear-resistant valve. Precision ground tight closing ball seat. Interchangeable orifice cartridge insures proper sizing of valve to installation.

## ★ K-15 AND K-20 MAGNETIC STOP VALVES

Magnetic liquid and suction stops for freon, methyl chloride and sulphur dioxide for pipe threads, solder or flare fittings. Maximum fluid operating temperature, 240°F. Two-wire, current failure, high pressure valve handling large capacities with minimum pressure drop.

## ★ K-10-7 or 8 AMMONIA LIQUID STOP

Magnetic lever action. Highly wear-resistant. Durable needle. Waterproof coils. Any voltage, A. C. or D. C. Current failure valves of packless construction. Lever action develops six times the power of usual type solenoid. High pressures. Tight shutoff. Type K-10-7 and K-10-8 valves especially designed for ammonia.

**GENERAL**  
801 ALLEN AVENUE



**CONTROLS**  
GLENDALE 1, CALIF.

FACTORY BRANCHES: Philadelphia, Atlanta, Boston, Chicago, Dallas, Kansas City, New York, Denver, Detroit, Cleveland, Pittsburgh, Houston, Seattle, San Francisco. Distributors in Principal Cities.

#### KANSAS CITY CHAPTER

*Kansas City, Kan., Nov. 7*—President Ferguson opened the meeting with an explanation that the proceeding of this meeting would be reversed and that the "Educational Hour" would be the first part of the program for the benefit of the speaker of the evening. He then introduced Mr. Max Pehl, who is Secretary-Treasurer of the Kansas City Section of A.S.R.E., and who for many years has had positions in several of our local schools and colleges instructing in ventilation and air conditioning. Mr. Pehl's paper was titled "Short History of Ventilation." He took us back to sixteenth century, and gave examples and references of induced ventilation by Greek Architects; how several architects had made changes in the House of Parliament of England to satisfy the Assembly through the ages. This paper proved very interesting from a historical standpoint.

#### WYOMING VALLEY CHAPTER

*Wilkes Barre, Pa., Oct. 8*—Following the business session, the meeting was turned over to Mr. Lodwing of Alco Valve Company who gave an interesting talk on thermostatic expansion valves, suction pressure valves and modulating valves. Considerable discussion among the members followed with questions being answered by Mr. Lodwing.

Mr. Maneval, President, resigned his office in the chapter and has accepted a position with Schonrick Electronics Co. of Sellersville, Pennsylvania. A nominating committee was appointed for the forthcoming election of officers. On the educational program, Mr. Kearney of Ansul Chemical Company presented movies which were enjoyed by the entire meeting.

#### CORN BELT CHAPTER

*Bloomington, Ill., Nov. 17*—The meeting was preceded by a banquet called to order at 6:30 P.M. at the Hotel Illinois. The banquet was a celebration of the success of the State Convention to which the chapter acted as host. The speaker of the evening was Richard N. Meyer of Alco Valve Company. Mr. Meyer gave a talk on valves manufactured by his company.

#### GOLDEN GATE CHAPTER

*San Francisco, Cal., Oct. 18*—Golden Gate Chapter has been holding meetings since April of this year with steadily increasing activities and a steady growth of member-

ship. On this particular date the business session occupied the first part of the evening followed by an educational program, the principal speaker of which was Bill Lee of General Electric Company. Mr. Lee gave an interesting talk on preventative maintenance on fractional horsepower motors.

*Nov. 8*—After the business session was disposed of, W. H. Ball, Lubrication Engineer, Texaco Oil Company, gave an interesting talk on lubrication. This important subject proved highly interesting to the members who devoted sometime to discussion and questions following the presentation.

#### PROVIDENCE CHAPTER

*Providence, R. I., Nov. 7*—This is the first meeting of the winter season and the first order of business was the annual election of officers. Those elected are: *President*, Peter Miller; *Vice President*, William Ralston; *Second Vice President*, Arthur Doucet; *Secretary and Treasurer*, Hallam Richardson; *Sergeant-at-arms*, George Martin. The monthly meeting dates were changed from the second Wednesday of the month to the first. The balance of the evening was devoted to business matters.

#### TWIN CITIES CHAPTER

*Minneapolis, Minn., Nov. 6*—During the business session the entertainment committee reported on arrangements being made for the future dinner and dance. Henry Sundgaard reported on the progress on the proposed St. Paul City Ordinance. George Solberg was accepted as a Junior Member. On the educational program, Ted Hartman of General Mills presented an interesting demonstration on three stage refrigeration.

#### CHICAGO CHAPTER

*Chicago, Ill., Nov. 13*—During the business session of the evening, Ed Riccio reported on arrangements completed thus far for the banquet to be held sometime in January. Considerable discussion arose on the matter and committees were appointed to carry on the work. The chapter discussed the advisability of buying a motion picture projector, with R. L. Hendrickson being asked to investigate the possibilities. Dwight D. Orr, educational chairman, introduced the speaker of the evening, F. R. Weirman, Chicago Seal Co., who gave an instructive talk on the Chicago Seal products.



# KRAMER *Radial* UNIT COOLER



## 1. SAVES SPACE.

Installed in mid-ceiling—occupies a minimum of overhead space.

## 2. EFFECTIVE AIR DISTRIBUTION.

Even discharge in all directions assures uniform temperature throughout the refrigerator.

## 3. CORRECTLY ENGINEERED.

Low discharge velocity  
High relative humidity

## 4. TOPS IN CONSTRUCTION.

All copper coil.  
Ball-bearing motor, totally enclosed.

### REQUIRES NO OILING.

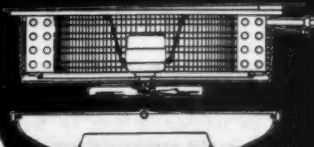
Built-in Heat Exchanger.

Silent fan.

Bottom pan easily removable for free access to all parts.

## 5. ATTRACTIVE.

Two-tone crackle finish.  
Specially designed Venetian discharge Grille.



SEND FOR  
CATALOG R 142 RS

## KRAMER TRENTON CO.

*Trenton, New Jersey*

## HOUSTON CHAPTER

*Houston, Texas, Nov. 13*—Mr. Daniels proposed formation of a bowling team to represent the chapter in the local bowling league. Mr. Arbuckle, the speaker for the evening, gave an educational talk on maintenance of motors. Following the adjournment of the meeting, coffee and doughnuts were served by Mr. Daniels, and a film depicting the ten cardinal points of salesmanship was presented by Mr. Kellett.

## READING CHAPTER

*Reading, Pa., Nov. 20*—After a short business meeting the educational committee took over and introduced Mr. Christman of the Christman Ice Cream Co. of Hamburg, Pa. Mr. Christman and his associate showed movies on the manufacture of ice cream and allied products. Another movie was shown called "On The Air" made by The Westinghouse Mfg. Co. This picture was very interesting and showed how radio broadcasting first started over KDKA in Pittsburgh, Pa., in 1920 and showed the improvements over a period of time until the present date. Another movie was shown just released by the U. S. Government showing how our battleships found the enemy at night and destroyed same with the aid of "Radar." Mr. Christman served some of his delicious ice cream after the meeting.

## TRI-STATE CHAPTER

*Huntington, W. Va., Oct. 9*—James Thacker gave an interesting talk on his experiences while in the armed services. Mr. Ward was the holder of the lucky number winning the jackpot prize. Following the meeting, many of the members went to the home of Mrs. Brunton where the ladies were meeting and were served sandwiches and coffee by the hostess.

## COLUMBUS CHAPTER

*Columbus, Ohio, Nov. 14*—The meeting was attended by over 50 members who were entertained by the speaker of the evening, W. S. Smith of the Johns Manville Co. Mr. Smith presented motion pictures on heat, then followed this presentation with a talk on insulation, which proved highly interesting. Lunch was served after the meeting was adjourned.

## ST. LOUIS CHAPTER

*St. Louis, Mo., Oct. 16*—President Braun called the meeting to order and introduced the speaker, Dr. Arthur L. Hughes, Professor of Physics at Washington University. His lecture, though not on refrigeration, was one which was highly informative to all members. He began his talk by explaining the structure of the atom and the process of cracking it to release the energy stored in its nucleus. He next went into the principle of the atomic bomb and explained how St. Louis having the only underground cyclotron here in the United States was fortunate to have been quite instrumental in laying the groundwork for the bomb development. He talked of the cyclotron, its uses in the present and for the future; its possibilities in the field of medicine and other sciences, how it could give radio-active powers to many common elements which could then be used in the treatment of many diseases just as radium is used today.

He then opened the meeting to a question and answer period; during which time he explained the location where the major natural resources of materials for use in the atomic bomb were found; the practicability of drying machinery with this power; its percentage of efficiency, etc.

## WATERBURY CHAPTER

*Waterbury, Conn., Nov. 7*—It was a gala occasion for the charter presentation. Master-at-Arms Daniel LaPorta called the roll and with the exception of Mr. Senkus of Bethlehem and Robert Whiteside, all members were present.

After a few remarks from the chair we opened under new business and President Peffers called on Acting President Mr. Buschkopf of the International Society to present the charter.

Before the meeting was called to order at the start we were served an excellent turkey dinner that was enjoyed by all. We had thirty out-of-town guests and thirty-two local members and their guests. Among the out-of-town guests were three from Bridgeport, nineteen from Hartford, eight from New Haven and one from Providence. These included Vice-President Garland of the International Society who drove over from Providence with Mr. Buschkopf, and Secretary Lee Wallace of the New England Association.



25 lb. can illustrated.

## The Ideal Dehydrant for Refrigerants

JAY CEE refrigeration gel is one of the most efficient dehydrating agents. It is especially prepared for dehydration of refrigerants, and may confidently be used for drying Freon, Methyl Chloride, Sulfur Dioxide or any other similar agent. Removes acids, prevents rust or corrosion and is not affected by oil. The special particle size retains its crystalline structure—assuring uniform distribution in the cartridge and complete contact with all pore surface areas.

We offer you this economical 25-lb. container with resealable Easy-Pour spout. Dehydrators can

easily be filled from this Easy-Pour container, and resealed to protect unused contents until needed. Special gasketed cover makes Easy-Pour container air-tight when not in use.

This highest quality product is also available in 1-pound, 5-pound, and 10-pound resealable metal containers, and in 100-pound bulk drums which can easily be sealed air-tight after use.

There are excellent opportunities for jobbers and distributors to develop profitable business on Jay Cee Silica Gel in a few territories. Write for details.

JOLIET CHEMICALS, LTD., INDUSTRY AVENUE, JOLIET, ILLINOIS



# SILICA GEL

*A superior dehydrant*

## ONTARIO MAPLE LEAF CHAPTER

*Ontario, Can., Oct. 19*—Mr. Harold Donnell presided over the meeting held in the King Edward Hotel. Art Doan, educational director of the chapter, introduced Mr. I. M. Bodine, Executive Engineer of the Canadian Ice Machine Co., Ltd., who spoke on the subject "refrigeration units, components and design, as applied to load conditions." His talk was exceedingly well presented and thoroughly enjoyed by all those present. J. W. McKee extended to Mr. Bodine the appreciation of the chapter and all those present for the splendid address and thanked him for his time and effort in appearing before the chapter. Mr. Bodine also provided informative literature of which the membership was invited to avail themselves. Three new applicants for membership were accepted. They were Norman L. Bell, Edward R. Baer, and Carl G. Heilig. During the business session of the evening, Mr. Marshall Lock suggested that another meeting be held in Hamilton and thought that the second stag night of the winter session would be a nice occasion for the meeting. It was suggested that the Niagara Frontier Chapter of Buffalo be invited to attend. Other business matters occupied the balance of the meeting.

## MOUNT ROYAL CHAPTER

*Montreal, Quebec, Nov. 2*—This was the occasion of the annual oyster party of the Mount Royal Chapter held at the Cafe St. Jacques. This get-together of members and friends proved to be everything that the connoisseur could expect with oysters that were excellent, plenty of liquid refreshment and a floor show that included Godiva, less her horse. Mac Turner, of Motor Repair Ltd., not forgetting his oyster knife and was it in great demand. Joe (Stalin) Bastien, of City Refrigeration, discussing the postwar situation and saying "Didn't I tell you the Russians could do it." Ross Turner of Kelvinator, believing that Toronto is the only city in the world.

*Nov. 15*—The meeting was called to order by the President, C. A. Fabien, Mr. Gordon Roe of Canadian Industries Ltd., introduced the speaker of the evening, Mr. R. J. Thompson, of Kinetic Chemicals, Inc. After giving a very interesting and enlightening talk on "Freon" Mr. Thompson answered questions pertaining to some of the everyday problems that the refrigeration service

man encounters, the business of the Chapter was then taken up.

## MONUMENTAL CHAPTER

*Baltimore, Md., Nov. 27*—On the educational program, Fred House of the Mueller Brass Co., gave an interesting talk and demonstration on the correct method of soldering. Mr. House expressed regret that the part situation was such on sweat fittings that he was unable to let members try their hand at soldering, but promised that as soon as fittings became available and if the members wished it he would return with enough material for a general demonstration.

## SAN DIEGO CHAPTER

*San Diego, Cal., Nov. 15*—With a good attendance of members and refrigeration men from the local Naval and Marine establishments, the meeting was called to order by President French. Several important items of business were transacted. The Constitution and By-Laws Committee presented their completed report, and after a reading and discussion, the Chapter Constitution and By-Laws were adopted as read. Of equal importance was the nomination for officers for the coming year. After some lively discussion, the lists were ordered closed for the evening. A committee was appointed to obtain a permanent meeting place, since the meeting room we have used for the past year through the courtesy of the Anderson Refrigeration Service, is to become part of the large display floor planned by Mr. Anderson.

After the business of the evening was concluded, Mr. K. H. Young, a member of the Chapter, gave us a very interesting talk on his experiences in installing a deep-freeze room in the Merchants Refrigeration Company building in New York City some years ago. After the meeting, sandwiches and refreshments were served.

## DAYTON CHAPTER

*Dayton, Ohio, Nov. 8*—Upon the suggestion of the Secretary and unanimously agreed, that the dues of Ralph McCandlish, a returned veteran and a former member of the Columbus Chapter be paid from the chapter's treasury. The educational feature of the evening consisted of a discussion of some of the problems of commercial refrigeration.

## **REFRIGERATOR COIL CLEANER**



## **DE-SCALES**

**Condenser Coils  
Unit Coolers  
Spray Heads  
Compressor Jackets  
Refrigerator Drains  
Water Fountain Coils  
Sulphured Compressors**

**FACTORY SALES CO-OPERATION**

*Write for Literature or Refer to Your Local Jobber*

## **SKASOL CORPORATION**

**WEBSTER GROVES 19, MISSOURI**

Nov. 29—There was quite a long business session during which the nominating committee was appointed to present a slate of officers for the first meeting of the year. Open discussions on service problems occupied the educational period and a report was given on the forthcoming Christmas party to be held in December.

#### BOSTON CHAPTER

Boston, Mass., Oct. 9—F. Y. Carter, Detroit Lubricator Co., was the speaker on the educational program who explained and showed the progress of the Thermostatic Expansion Valve. Business occupied the balance of the meeting during which the following members were admitted to membership: Anthony Magliaro, Howard O. Wilber, Harold E. Anderson and William R. Hein. In addition an application for Junior Membership was received from Robert Traynor.

Nov. 13—A very interesting and instructive demonstration on silver brazing and light gas welding was presented by H. S. Haywood. Messrs. J. Lawrence Hall and James McCue were appointed on the nominating committee, and following the meeting refreshments were served the membership.

\*\*\*

### News From— The Dispatcher

ALEX GORDON, former secretary of Chicago Chapter R.S.E.S., is planning on moving to California where he will seek employment in the refrigeration field.

J. M. Gantt, Montgomery, Alabama, has been released from the Army Air Forces and is again doing refrigeration work.

Kenny Young, El Centro, California, one of the most popular members of the San Diego Chapter, has had to quit working for some time because of an eye infection. The infection was contracted while working on Navy ships returning from the tropics which carry almost every kind of "bug" known.

John H. Hudgens, now on terminal leave as Major in the Army Air Forces is to be president and general manager of the newly formed Electrical Appliance Company, Albany, Georgia. The company has been granted the franchise for 24 counties in Southwest Georgia by the York Refrigeration

and Air Conditioning Company. Other officers include John W. Crouch, vice president, and Mrs. Edith Stubbs, treasurer.



F. H. TISON, formerly with Tison Refrigeration Co., Albany, Georgia, is discharged from the Navy after three and a half years. Twenty-five months of this time he spent in the South Pacific Islands installing and maintaining the refrigeration equipment so necessary to the armed forces. For the past year Tison has been stationed at Camp Parks, California, in charge of refrigeration instruction. He is back in Albany now operating under the name of Bonded Refrigeration Company.

The Advanced Refrigerating Company has recently been opened at 645 South Seagrave Avenue, Daytona Beach. It is conducted by George Brasen and W. E. Townsend. Brasen served in the Marines; Townsend in the Army.

T. E. Williamson has opened the Refrigeration Service at 105 North Lincoln Avenue, Lake Wales, Florida.

Floyd W. Pelton and Virgil L. Pool have published a certificate that they are conducting business under the firm name of Glendale Refrigeration Sales and Service, at 429 South Central Avenue, Glendale, Calif.

The Golden Rule Electric Shop has negotiated a long-term lease on a modern five-story fireproof building at 116 West Seventh Street, Cincinnati, Ohio, in the midtown retail shopping area. The street floor of the new unit will contain a modern display section, parts department and executive offices. The second floor will have complete service department with expanded line of merchandise. Upper floor will be devoted to sales and display rooms, including kitchen cabinets, heating equipment, furniture, refrigerators, radios, air-conditioning and other home appliances.

Building permit has been issued for construction of a store and office building, 100 x 54 feet in area, at 7003 South Western Avenue, Los Angeles, California, for the California Refrigerator Repair Shop, Inc., at a cost of \$42,000.

Frederick A. Martzolf has filed a business name in Buffalo, N. Y., for the Martzolf Refrigeration Service, 5 Humphrey Street.



# KEROTEST

## TURN TO YOUR JOBBER

*first  
and always*



**KEROTEST  
VALVES • FITTINGS**  
AND ACCESSORIES FOR THE  
**AIR CONDITIONING and  
REFRIGERATION INDUSTRY**

"Kerotest is one of just  
fifteen manufacturers  
to receive the FIVE Star  
and Gold award for their  
War-Time Flag."

FOR THESE

### *Very Good Reasons*

#### ● TRAINED SALESMEN

You'll find no *ribbon clerks* at your Kerotest jobbers—every man is a hard-working, hard-hitting salesman, completely schooled in technical "know-how" and product knowledge. He's a very helpful fellow—ready to aid you on any problem.

#### ● NEW PRODUCT INFORMATION

Your Kerotest jobber is well informed, in advance, on new developments, new products and new ways to use time-proven items. The frequent contacts between jobber and buyer promote more up-to-the minute knowledge and early use of these new ideas.

#### ● TECHNICAL KNOWLEDGE

Your Kerotest jobber's technical knowledge is the result of many years experience—it is not confined to a single line or product but to the broad needs and requirements of his customers.

#### ● LARGE INVENTORY STOCKS

Your Kerotest jobber has a strong purchasing power—and in these abnormal times is able to procure the "almost" impossible items you need so badly. Under normal merchandising conditions his stocks are large and ample.

#### ● EFFICIENT PERSONNEL

Your Kerotest jobber's staff is trained to recognise every opportunity in which they can provide SERVICE—more efficiently and promptly—to give intelligent information, quickly and courteously.

#### ● FAST DELIVERY

In these difficult days, your Kerotest jobber provides a quick and systematic delivery service—so that little time is lost, and for postwar his service will be even *faster*.

#### ● HELPFUL AID

Turn to your Kerotest jobber *first and always* for the most accurate and up-to-the minute product information, for help on your toughest problems.

**KEROTEST MANUFACTURING CO.**  
PITTSBURGH, PENNA.

Branch Offices:

NEW YORK • CHICAGO • HOUSTON • LOS ANGELES



# New and Improved Appliances

Addresses of Manufacturers represented in this department can be obtained from the Editor

## New Low-priced Welder

A NEW low-priced welder which is ideal for rural power lines and is said to overcome all the objectionable features of previous welders designed for this type of service has just been announced by The Lincoln Electric Company.

The new unit, called the "Fleet-Arc Jr." is for 230 volt, single phase power lines and meets the limited input requirements of rural Utili-

ties and REA by a design of high efficiency and high power factor. It has a maximum input current of 35 amperes and provides a machine which meets the new NEMA standards for this type of welder. It can be used with the standard 3-KVA power transformer provided by the power company. Current range is from 20 amperes at 20 volts to 180

amperes at 25 volts welding duty. This gives sufficient capacity for all types of jobs found on most farms or job welding shops. It will handle electrodes ranging from 1/16" to 5/32" diameter. The "Fleet-Arc Jr." which simplifies welding and multiplies its utility for repair and fabricating jobs done by farmers and average mechanics, inaugurates a revolutionary development known as the "Arc Booster" which provides quick, easy arc starting. The instant the electrode touches the work, the welding current is given a boost of intensity for starting the arc.

The current then reverts

automatically to the amount set for the job. No high voltages or special high frequency devices are used, the output voltage being limited to a maximum of 52 volts.

Either of the two degrees of arc boosting provided is selected by a snap switch, one for general work and the other lower amount for thin material such as automobile fenders.

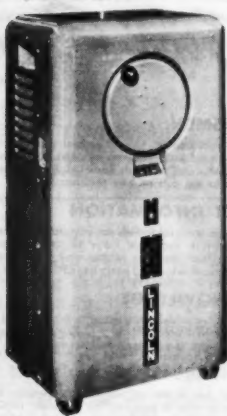
Current control for the new "Fleet-Arc Jr." is of the separate adjustable reactance type which is varied by turning a hand wheel. Adjustment is continuous over entire welder range of from 20 to 180 amperes.

Design and construction features of the new welder include:—

Wear-free and vibrationless reactor current control with self-cleaning chain drive. No taps or plugs to develop loose connections.

Heavy copper winding with spun glass insulation and mica coil separators. Arc welded steel frame and housing.

"Fleet-Arc Jr." weighs only 360 pounds and is, therefore, readily portable.



"Fleet-Arc Jr." Welder

ties and REA by a design of high efficiency and high power factor. It has a maximum input current of 35 amperes and provides a machine which meets the new NEMA standards for this type of welder. It can be used with the standard 3-KVA power transformer provided by the power company. Current range is from 20 amperes at 20 volts to 180

## Cutting Tool Grooves Plaster

A NEW machine, looking much like an electric buzz saw attached to the end of a vacuum cleaner hose, has been introduced to the field by Minneapolis-Honeywell Regulator Co.

necessary to all such jobs.

In a demonstration for the press Balch rapidly cut a groove in a hard plaster wall, the tool "inhaling" the dust in its own vacuum cleaner. Balch then showed how the



A new tool for cutting grooves in plaster

Capable of cutting precise channels in plaster walls, the unique portable "saw" with tungsten carbide teeth was said by the company to make possible installation of heating controls in apartment heating systems without the costly and time-consuming restoration and redecoration which heretofore have been

necessary copper tubing is buried inside this groove in the wall and then covered with a special plastic filler and masking tape so that the finished job is unnoticeable.

The complete job of burying the tubing, mounting a thermostat, and installing a valve should take no longer than an hour.

# Mills direct drive compressors

TOMORROW, YOUR CONDENSING UNITS WILL

*occupy less space*



*Less than half the size of conventional belt-driven units of the same rating, the new Mills  $\frac{1}{2}$  H. P.*

*Direct Drive Compressor\* occupies less cabinet space than any previously conceived condensing unit.*

\*  
We can't produce enough for everyone at once. May we, nevertheless, plan with you for the application of these space-saving compressors in your future cabinets?

## MILLS

*Industries, Incorporated*  
Refrigeration Division  
4100 Fullerton Avenue • Chicago 39, Illinois

## Frigidaire Home Freezer

THE Frigidaire Division, General Motors Corporation, Dayton, Ohio announces the first of its contemplated home freezers, a four cubic foot cabinet or horizontal

power with slightly less than 1½ kilowatts of electricity in a normal room temperature for a period of 24 hours.

Officials of Frigidaire believe that this and other



The new Frigidaire home freezer

model. This cabinet is in a finish of white baked enamel.

The outer dimensions of this cabinet are: height, 36" to the top of the cabinet; length, 34½"; and width, 24". The storage space is 12¾" wide by 24 5/16" long by 23" deep, thus giving slightly more than four cubic feet of storage space in the cabinet. The total weight of the freezer is 250 pounds and it is operated by the Meter-Miser unit of 1/9th horse-

power. Freezers planned for future production will be available to the public shortly after January 1, 1946. Present plans call for an 8 cubic foot cabinet model, an upright model, with a capacity of 5.1 cubic feet and a "Super-Freezer" chest in the deluxe Frigidaire refrigerator, in addition to the 4 cubic foot model, thus presenting home freezers in forms that will meet the requirements of the public.

users' requirements. The Model T makes maximum use of minimum floor space, being only slightly over 7 feet long.

For installations requiring less storage capacity, the Model R, with one deep and one shallow tank, provides 15.4 cubic feet. This unit fits into a space just over 5 feet long. The shallow tank may be used for either dry or wet storage, while the deep tank adds great flexibility to the unit because of the various rack and shelf arrangements for which provision is made.

The third Blue Flash unit is the Model N, whose two shallow tanks provide 9.6 cubic feet of storage capacity. In this model, both tanks may be used for dry or wet beverage cooling or one may be used wet and one dry. A floor space just over 4½ feet long will accommodate the Model N.

Blue Flash liquid and solid food refrigerators always have featured a direct expansion refrigeration system with 5-sided application of the cooling coils. Coils are soldered directly to tank walls to provide conductive cooling, the result being more uniform temperature maintenance and superior dry sanitary refrigeration within the tanks.

Blue Flash cabinet insulation is hermetically sealed to guard against damage from moisture or vermin. Effectiveness of the insulation also is increased by this type of construction.

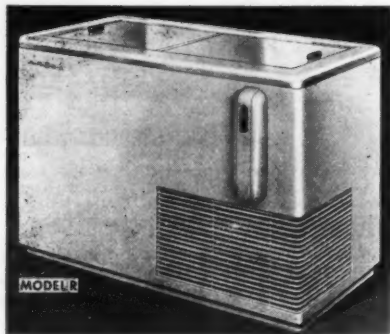
The deep tanks embodied in the two larger Blue Flash models make these units surprisingly versatile. Maximum capacity in minimum floor

## Blue Flash Coolers Return

THREE brand new models of the Blue Flash Refrigerator now are being offered by The Brunswick-Balke-Collider Company, Chicago, Illinois.

Largest of these food and beverage refrigerators is the Model T. Its 3-compartment cabinet will accommodate an amazing amount of bottled goods or solid foods. One shallow and two deep tanks provide a total of 25¾ cubic feet of storage space that can be divided between dry and wet refrigeration to suit the

Brunswick-Balke beverage cooler



## REFRIGERATION SERVICEMEN

*Your customers who own  
Meter-Misers depend on  
you to keep them in  
operation.*

Don't let them down for lack of  
refrigerant to recharge these  
FRIGIDAIRE units—Get a sup-  
ply of



### the Ideal REPLACEMENT GAS

Customers and service men alike are  
finding this gas measure up to their  
standards of performance in Meter-  
Misers. Servicemen experience no  
difficulty in making this replacement  
to the complete satisfaction of their  
customers. Meter-Miser service be-  
comes a routine call to the shop that  
carries a supply of HERVEEN.

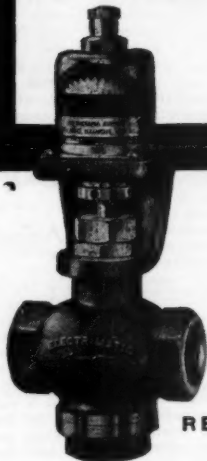
Send for bulletin on  
"Procedure for Recharging  
Meter-Misers with HERVEEN"

For deliveries, see your local jobber or write to

**Modern Gas Co., Inc.**  
Manufacturers & Refiners  
1084 BEDFORD AVE.  
Brooklyn 5, New York

SERVICE ENGINEER

## EFFICIENT... ECONOMICAL



TYPE  
**WP**  
PRESSURE  
ACTUATED  
REGULATING  
VALVES

Individually tested for efficient, economical  
operation. WP regulating valves may be  
mounted in any position and will give last-  
ing, trouble-free performance. Brass body,  
two ply power bellows and corrosion re-  
sistant materials for all internal parts. They  
are designed not only to start and stop the  
flow of water but also to feed the economic  
amount of cooling water to secure the proper  
condensing pressure without waste. The  
water flow increases and decreases with the  
rise and fall of actuating pressure.

WP regulating valves are available in  
 $\frac{3}{8}$ ",  $\frac{1}{2}$ " and  $\frac{3}{4}$ " FPT sizes and other valves  
of other types are available in sizes ranging  
from  $\frac{3}{8}$ " to 2" FPT.

Write for a copy of our latest catalog.

## Electromatic

2100 INDIAN AVENUE  
CHICAGO 16, ILL.

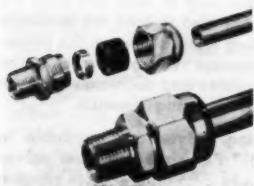
space is provided by this feature without affecting the accessibility of any part of the unit.

All Blue Flash refrigerators have easy-sliding lids of stainless steel, stainless steel tops, rubber-covered lid stops, modernizing compressor grill, large detachable bottle-cap receptacles, massive electrically-welded steel frame, heavy-gauge, rust-proofed steel wrapper and a thoroughly dependable, fully guaranteed commercial compressor unit.

Soon to join the Blue Flash line are two sizes of Frozen Food Storage Refrigerators. These units will bring to their field the same principles of good refrigeration engineering that distinguish all Blue Flash refrigerators.

### Flexigrip Tubing Fitting

**F**LEXIGRIP time-saving tubing fittings which eliminate end preparation or soldering of the tubing and yet produce a stronger, leak-proof and flexible joint have been announced by Gustin-Bacon Manufacturing Company of Kansas City, Missouri. The Flexigrip fitting, made in standard sizes from  $\frac{1}{8}$ " to  $1\frac{1}{2}$ " O.D., consists of four parts—the body, a gripping ring, synthetic rubber



Flexigrip coupling

gasket and nut. To attach the fitting, the nut (with gasket and ring inside) is slipped over any plain-end tube, cut to desired length. The tubing end is inserted into the body as far as it will go and the nut tightened. Tightening the nut compresses the ring into a tight grip and moulds the gasket around the ring for a leak-proof seal that is so flexible it will withstand unusual vibration or impulse.

Elimination of flaring, swedging, or soldering, the tube end adds considerably to the strength of the joint as well as saving time and labor. Economies in time and material are also considerable over the collar, ring or ferrule type of tube-end fitting. The time-saving factor and the resulting stronger joint should give the new Flexigrip fitting ready acceptance, especially in tubing applications where vibration or leakage are important considerations.

Flexigrip tubing fittings are available in brass, aluminum or steel.

### Adjustable Capillary Tube

**T**HE Floco Flotube is recommended for use in connection with fractional horsepower, single circuit refrigerating systems which use either Freon, Methyl Chloride or Sulphur Dioxide as a refrigerant.

It imparts such an accurate control of refrigerant that its use is widely indicated where economy in initial expenditures and continuous trouble-free operation are prime requisites.

The operation of the tube is very simple. It has neither valves nor stuffing boxes to get out of order and is externally adjustable. It is simplicity itself.

The Flotube is connected in the liquid line by means of ordinary flared fittings. The expansion of the refrigerant is controlled in this way: Mounted on the tube is a choke collar which is controlled by the tightening action of a choke nut. When the nut is drawn up, it results in a uniform pinching of the copper tubing until



Floco Flotube

the desired expansion valve effect is obtained. This special design, for the first time, imparts to a refrigerant expansion tube an accuracy of control adjustment heretofore believed impracticable.

The tubes come in two different models which fit all jobs from  $\frac{1}{8}$  hp. up to 1 hp.

They are equipped with a large self-contained strainer to eliminate clogging.

Flotubes are manufactured by Flow Controls, Inc., 1821 W. North Avenue, Chicago 22, Illinois.

### New Air Duct

**A** NEW material, "Airtron," created during the war for aircraft heating and ventilating, is now available for other manufacturers as a ducting for hot or cold air.



Airtron for air ducts

Made of glass cloth and rubber, it provides very high insulation qualities as well as great flexibility. The flexibility makes its use very desirable where vibration is present, for it will operate indefinitely under conditions where metal ducting would develop fatigue cracks. Tests indicate that the heating, ventilating and air-conditioning of future planes, trains, automobiles, buses and homes will use a great deal of Airtron.

It withstands temperatures from minus 60 degrees F. to 300 degrees F. without a change in properties and will stand well over 50 pounds per square inch internal pressure at all temperatures. It is unaffected by air, light, water, gasoline, oil and all but concentrated mineral acids. Manufactured in tubes from 1 inch to 6 inches in diameter and in any length desired, as well as in specialized shapes where required

for unusual installations, the ducting can be adapted to any equipment as a replacement or as an original installation.

Airtron is made only by Arrowhead Rubber Company. Its research men are now working with a number of manufacturers who are desirous of employing this versatile material in their products and processes.





## "FARTHEST NORTH" in Modern Refrigeration

Write for catalogs, engineering assistance, or a representative to call.

DOLE REFRIGERATING CO., 5910 N. PULASKI RD., CHICAGO 30, ILL.  
N. Y. BRANCH, 103 PARK AVE., NEW YORK 17, N. Y.

## Rebuilding and Exchange REFRIGERATION PARTS

Fully illustrated catalog  
of valuable information and  
prices sent on request.

- COMPRESSORS
- CONDENSERS
- WATER VALVES
- CONTROLS
- EVAPORATORS
- FLOAT VALVES

*Send Today for This Useful Catalog*

**REFRIGERATION MAINTENANCE CORPORATION**  
321 EAST GRAND AVENUE • CHICAGO 11, ILLINOIS



Major Arthur S. Alter, just returned from Germany, receiving delivery of the first 1946 Ford car delivered in the Chicago area from Harry M. Lucas. Major Alter after his discharge will resume his prewar job of Vice President and manager of the Radio and Appliance Division, Harry Alter Company, wholesale distributors of Crosley products in Chicago.

### FROZEN FOOD LOCKERS

**S**TUDENTS, returning servicemen, teachers, and others interested in the frozen food locker industry as an occupation will find helpful information in a six page leaflet entitled *Frozen Food Lockers* just published by Occupational Index, Inc., New York University, New York 8, N. Y. Single copies are 25¢, cash with order.

This is one of a series of 75 such leaflets describing opportunities in 75 different occupations. Each one covers the nature of the work, abilities and training required, earnings, entrance and advancement, and miscellaneous advantages and disadvantages.

\$\$\$

### DU PONT HAS NO INTEREST IN I. G. FARBEN

**E.** I. du PONT de NEMOURS & CO. issues the following statement:

Recurring reports from Germany giving the impression that the Du Pont Company is a substantial stockholders in I. G. Farbenindustrie are entirely incorrect. The Du Pont Company has no investment whatever in I. G., or any of its subsidiaries.

The latest of these reports is a statement attributed to Colonel Edwin S. Pillbury, identified as Farben Industry control officer.

The only stock interest Du Pont ever had in I. G. Farben, in fact, came as a result of an investment of \$1,785,522 made in 1925 in the stock of two German explosives firms, Dynamit A. G. and Koln-Rottweil, which later were merged with or came under the control of I. G. The Koln-Rottweil shares were converted into I. G. shares. The investment was later increased, by the exercise of purchase rights, to a total of \$2,395,316, which was approximately one-half of one percent of the issued shares of that company.

Du Pont began disposing of its investments in I. G. in 1933. Sale of its whole remaining I. G. investment was authorized by Du Pont in 1934. This proved difficult because of currency regulations and blocked mark requirements. The I. G. stock was, however, fully disposed of in 1940, at a loss of \$671,406, and the Dynamit A. G. shares, sold at the same time, were liquidated at a loss of \$534,359.

\$\$\$

### N. M. DUNNING TO REPRESENT SUPERIOR VALVE & FITTINGS

**N.** M. DUNNING has recently been appointed factory representative for Superior Valve & Fittings Co. and will be responsible for sales in the territory including the States of Kentucky, West Virginia, Ohio, Eastern Michigan, Western Pennsylvania, Western New York and Eastern Canada.

His early experience was in the architectural and construction fields.



**N. M. DUNNING**

Leaving this industry, he turned to refrigeration and air conditioning, and later joined the General Electric Company. During the 1930's he conducted a number of the G. E. Air Conditioning Institute training schools and was in charge of engineering and sales in Chicago and Cleveland. He later became Eastern District Representative for the White-Rodgers Electric Company, specializing in air conditioning and refrigeration, electrical and hydraulic control work. Since the outbreak of World War II and until the

## The Service Man's Ally against Moisture



**ANSUL**

**ICE-X**  
TRADE MARK REG. U.S. PAT. OFF.

ICE-X quickly cures emergency freeze ups when ice forms at the expansion valve or capillary tube. Harmless to use. Great for Freon, Carrene, or Methyl Chloride systems ... The dependable liquid anti-freeze.

**ORDER FROM YOUR JOBBER OR—**

EXCLUSIVE NATIONAL DISTRIBUTOR

**THE HARRY ALTER CO.** 1728 S. MICHIGAN AVE.  
CHICAGO 16, ILLINOIS

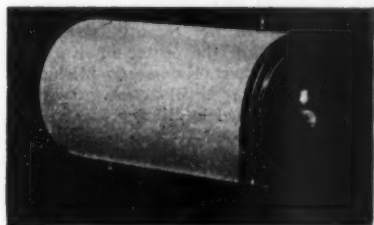
**JOBBER: WRITE FOR SPECIAL PROPOSITION!**

## NORMAL SUCTION PROCESS WATER COOLERS

6 to 25 gallon capacities.

Compact in design ... can be mounted on floors, walls or ceilings.

Suitable for drinking water bubbler service, cafeteria or restaurant glass filler service.



**DAY & NIGHT**

**COOLER DIVISION**  
DAY & NIGHT MFG. CO.

*One of the Dresser Industries*  
MONROVIA, CALIFORNIA

FACTORY REPRESENTATIVES  
NEW YORK CHICAGO  
A C Hummeyer, 682 Bldg. • Marc Shantz, 565 Wash. Blvd.  
ST. LOUIS DECATUR, GA.  
B H Spangler, 3331 Market St. • J. F. Parker, 228 2nd St.

present, Mr. Dunning served with the Philadelphia Ordnance District as Chief Supervisor of Production Personnel Training, Deputy Director of Production and Acting Director of Production, in successive order.

He will make his headquarters at the factory in Pittsburgh, Pa.

§ § §

#### W. D. WOOD BACK WITH G. E.

**W**ALTER D. WOOD has been appointed assistant to the manager of the appliance distributing branches of the General Electric Company, it has been announced by P. A. Tilley, manager of the branches.

A graduate of the University of Oklahoma, Mr. Wood joined G.E. in 1934, and has held positions in Schenectady and Bridgeport. Since 1941, when he entered the Army as a first lieutenant, he has served in the offices of Chief of Ordnance, of the Under-Secretary of War, and of Fiscal Directory Headquarters, in Washington, D.C. At the time of his release from service, he held the rank of lieutenant-colonel.

§ § §

#### T. W. BINDER CO. TO CHANGE NAME

**A**S OF January 1, 1946, T. W. Binder Co. will change its name to Tesco Distributors, and will remain under the exclusive ownership of Theodore and Sidney Yecies.

Keeping in trend with the times and looking to the future, they have purchased a lot 100 x 100 on which will be erected a modern structure, exclusively for their use.

Tesco Distributors will handle only refrigeration and air conditioning parts and supplies, catering to dealers throughout Northern Jersey.

§ § §

#### HONECKER WITH BORDEN

**A**. E. BORDEN CO., Boston jobber, announces the addition of Norman C. Honecker to its staff in the dual capacity of refrigeration engineer and sales representative. Mr. Honecker is a graduate of Rensselaer Polytechnic Institute and was associated with Buffalo Forge Co. for five years and with the Fedders Mfg. Co. of Buffalo, N. Y. for twelve years. While with Fedders, he was engaged in laboratory research and development on their line of expansion valves, unit coolers and gravity coils, later taking charge of their Boston factory branch. Mr. Honecker will travel the Maine

and New Hampshire area with a portion of Eastern Massachusetts for A. E. Borden Co.

§ § §

#### F. L. RIGGIN OF MUELLER LIKES WESTERN STATES

**F**RED L. RIGGIN, JR., General Sales Manager of the Mueller Brass Co. has just completed an extensive tour of the Company's West Coast Sales Offices and Warehouses.

During his trip, Mr. Rigglin had an opportunity to meet a number of business leaders in these territories. He brought back with him a distinct impression of the enthusiasm held by those with whom he talked. This en-



F. L. RIGGIN

thusiasm finds expression in expanded operations which in a great many cases involves extensive construction programs backed by intelligent business planning.

"I was impressed with the caliber of businessmen in the Western States, with their energy, their ideas, and enthusiasm for their section of the country," states Mr. Rigglin.

The Mueller Brass Co., with general offices and plant in Port Huron, Michigan, manufactures the famous STREAMLINE Copper Tube and Solder Type Fittings, Brass, Bronze and Aluminum Forgings, and Screw Machine Products, as well as a complete line of Refrigeration Products used by most of the leading manufacturers of commercial and domestic Refrigeration and Air Conditioning units.

§ § §

#### EXPERIMENTAL STORE IN KALAMAZOO, MICH.

**A** NEW type of experimental store will be set up by Kalamazoo Stove and Furnace Company in the recently purchased Bates Building, in the center of Kalamazoo's business district, Kalamazoo, Michigan, according to Arthur L. Blakeslee, president.

The store, planned by Jack Morgan, Chicago designer, will serve as an experimental establishment where methods of display, merchandising plans and other phases of retail distribution will be tried out before being installed in retail stores. A model busi-



..... *before it becomes dangerous!*

Hidden leaks in refrigeration equipment cause serious damage to expensive installations and loss of costly products.

Years of use have proven **VISOLEAK** to be dependable, economical, safe and easy to use. See your refrigeration supply jobber, or write

**Western Thermal Equipment Co.**

1701 W. Slauson Ave., Los Angeles 44, Calif.

*try **VISOLEAK** today*

## Controls Repaired & Rebuilt

Just Mail In Controls—We Handle The Rest

**COMMERCIAL—DOMESTIC—INDUSTRIAL**

**One Year Guarantee  
Each Control Reset and Cycle Tested**

Domestic Cold Controls (Modern Type).....	\$2.00
Commercial Controls (Pres. or Temp.).....	2.50
Commercial Dual Controls.....	3.00
Automatic Water Valves.....	2.00
Automatic Expansion Valves.....	1.75
Thermostatic Expansion Valves.....	3.00

All Prices F.O.B. Chicago and subject to change without notice.

**ACME CONTROL SERVICE**  
5525 Lawrence Avenue—Chicago 30, Illinois  
Phone PENnsacola 3303



● Back again on a peace basis once more! That means the Aerovox line of motor-starting capacitors once again includes the widest selection of both exact-duplicates and those universal types that served so well during the war shortage. ● Be sure you make it AEROVOX for those replacements—and you'll be getting just the right type for the right job. ● Ask your jobber for Aerovox motor-starting capacitor replacements. Ask to see the handy replacement chart. Ask for catalog—or write us direct.

**AEROVOX**  
*Capacitors*  
**INDIVIDUALLY TESTED**

AEROVOX CORP. NEW BEDFORD, MASS. U.S.A.  
In Canada: AEROVOX CANADA LTD. HAMILTON, ONT.  
Export 13 E 40 St. New York 16, N.Y. Code: ARLAB

ness accounting method—developed within Kalamazoo's own branches during pre-war years—will be set up for study. Display units for large and small stores will be worked out. The model outlet will promote and sell the company's full line of stoves, refrigerators, washing machines, heaters and furnaces.

Model kitchens in basic kitchen types will be built and completely furnished according to a "work center" plan in which storage and work space allotment is broken down to fit kitchen functions. The cooking center, for instance, includes—besides the stove—room for storage of cooking utensils, spices and other staples used in cooking, counter space for filling plates right at the stove.

One floor of the new building will be turned into a sales training school for members of its selling staff, branch managers and franchise dealers. Here a home economist will demonstrate cooking methods in one of the model kitchens.

\*\*\*

#### NEW SCHAEFER DISTRIBUTORS

**S**SCHAEFER, INC., exclusive manufacturers of low temperature cabinet equipment since 1929, has announced the appointment of 61 distributors whose franchises cover the national field. Included in the Schaefer line are Pak-A-Way home and farm freezers and Schaefer ice cream and frozen food cabinets.

Taking the wraps off postwar manufacture, Schaefer is now in production of its three low temperature cabinet groups, according to Harold L. Schaefer, president of the Minneapolis concern. During the war, Schaefer produced special low temperature equipment for the armed services.

New distributors of the Pak-A-Way home and farm freezers include: Lockie & Glenn, Cincinnati; Lone Star Wholesalers, Dallas, Tex.; the Shield Co., Fort Worth, Tex.; Charles R. Bowman Co., Grand Rapids, Mich.; Jules Alexandre, Inc., Harrisburg, Pa.; Southwest Furniture, Ltd., Houston, Tex.; Refrigeration & Electric Supply Co., Little Rock, Ark.; Foster Distributing Co., Louisville, Ky.; Wayne Spinks Co., Memphis and Nashville, Tenn.; Clark Supply Co., Milwaukee, Wis.; General Electric Supply Corp., New Orleans, La.; and the T. S. Ponthan Co., San Antonio, Tex.

New distributors of Schaefer frozen food cabinets include: B. F. Austin & Son, Abilene, Tex.; Doherty-Stirling, Inc., Baton Rouge, La.; W. A. Case & Son Mfg. Co.,

Buffalo, N. Y.; H. E. Humphreys, Concord, N. H.; Vernon C. Frederick, Houston, Tex.; Passman Equipment Co., Monroe, La.; A. F. Briggs Co., Portland, Me.; Cable-Wiedemer, Inc., Rochester, N. Y., and Scranton Supply & Machinery Co., Inc., Scranton, Pa.

New distributors of Pak-A-Way freezers and Schaefer frozen food cabinets include: Charles S. Martin Distributing Co., Inc., Atlanta, Ga.; Legum Distributing Co., Baltimore, Md.; Gross Distributors, New York, N. Y.; M. L. Foster Co., Oklahoma City, Okla.; Thomas Blackett Co., Detroit, and the C. H. Malcolm Co., Seattle.

New distributors of Pak-A-Way freezers and Schaefer ice cream and frozen food cabinets include: Electric Appliances, Inc., Indianapolis, and the El Paso Hotel Supply Co., El Paso, Tex.

\*\*\*

#### HONEYWELL FORMS NEW DEPARTMENT TO HANDLE SPECIALIZED CONTROLS

**F**ORMATION of a Specialties Division to handle sales and production of special products has been announced by John E. Haines, manager of Commercial Control Sales, Minneapolis-Honeywell Regulator Company.

Martyn Kingsland, manager of the company's refrigeration controls division, has been named sales manager of the new department, Haines said, and will consolidate the activities of his former department with the new division and expand personnel accordingly. The new division also will handle modification of the company's regular heating and air conditioning controls for special applications and, therefore, speed production and delivery of instruments which must be made slightly different from standard products as well as the development and sale of new products to meet the particular requirements of specialized applications.

In the immediate future, Haines said, the Specialties Division will handle the sale of refrigeration controls, mercury switches, remote bulb thermometers, combustion con-



MARTYN KINGSLAND



**TIME TELLS THE STORY...**  
 Users everywhere praise the performance of Sanitary Quicfreez. And remember, thousands of Sanitary freezers were in use before Pearl Harbor.  
 BUILT BETTER TO LAST LONGER  
**SANITARY REFRIGERATOR COMPANY**  
 FOND DU LAC, WISCONSIN

**Sanitary Quicfreez**

**A Merry Christmas**  
 and  
**Happy New Year**  
 to all our old and new friends

**H. W. BLYTHE COMPANY**  
 2334 So. Michigan Ave. Chicago 16, Ill.

**A NEW SERVICE FOR YOU**

Refrigerator coils, air cooled condensers, evaporators, dehydrators and low side floats expertly repaired and thoroughly cleaned.

Prompt service. 90-day guarantee.

Write for prices  
**JOHN ANDERSON**  
 3416 North Cicero Ave.  
 Chicago 41, Ill.  
 Telephone: PENsacola 0190

**JUST TO SAY *Thank You***  
**AT THE TURN OF THE YEAR**

The good will of customers is our most valuable asset. No financial yardstick can measure its value. All of us here at Kramer's sincerely appreciate your friendship and pledge ourselves to do everything we can to merit your continued confidence.

We shall constantly work to make every service we now offer even more valuable to you and continuously search for new ways to be helpful.

And so, at the turn of the year, we thank you for the business entrusted to us, and promise our fullest cooperation in the days ahead.

**FRED C. KRAMER COMPANY**

212 N. Jefferson St., Chicago 6, Ill.

12 phones—Randolph 6288

Member

Refrigeration Equipment Wholesalers Association

trols, special control panels, special relay applications and temperature and pressure alarm systems. Other special applications of existing and new controls for Diesel engine and associated fields will be added in the near future.

§ § §

## H. A. MALCOM NOW SALES MANAGER OF CHRYSLER

**D.** W. RUSSELL, president of Airtemp Division, Chrysler Corporation, announced today the appointment of H. A. Malcom, formerly assistant general sales manager, to the position of General Sales Manager.



H. A. MALCOM

Mr. Malcom has been with Chrysler Airtemp for five years and has held several sales executive posts. He was Regional Sales Supervisor in charge of the Southern half of all U. S. markets before he became assistant salesmanager. As General Sales Manager, he will now administer the entire postwar sales program on Chrysler Airtemp's "triple line" of air conditioning, heating and refrigeration products.

Prior to his association with Airtemp, Mr. Malcom held sales executive positions with nationally known manufacturers of large volume products, such as automobiles, electric refrigerators, and electrical appliances. He served in the U. S. Army in World War I.

Mr. Malcom was born in Logansport, Indiana, and attended grade school and preparatory school there before moving to Chicago to attend Northwestern University. He makes his home in Dayton, where Chrysler Airtemp is headquartered.

§ § §

## ROBERS OF WEATHERHEAD TO PROMOTE AIRCRAFT SHOW

**G**ENE P. ROBERS has been appointed Vice President in Charge of Publicity and Promotion of the National Aircraft Show to be held in Cleveland, Ohio, January 11 to 20, 1946. Roberis is Sales Promotion Manager of the Weatherhead Company of Cleveland and has been given a ninety-day leave of absence by his company to head up

the promotion of the huge aircraft show.

The National Aircraft Show will attract national attention, being the first such show since 1939.

"This will be the largest aircraft show in history. With the endorsement and cooperation of General H. H. Arnold and the Army Air Forces, this show will portray to the public and aviation industry of the nation, all of the war weapons and equipment plus all of the new planes and equipment for the coming air age," Roberis said.

Extensive equipment of the Army Air Forces at Wright Field will be on exhibition as well as captured equipment from all theatres of war. Complete facilities of the large Public Auditorium at Cleveland will be taxed to capacity to house all of the exhibits.

§ § §

## GENERAL CONTROLS APPOINTS DIVISIONAL SALES MANAGER

**T**HE appointment of J. M. Schlemmer as Divisional Sales Manager of the Refrigeration Division was recently announced by

Mr. J. F. Ray, Director of Sales, General Controls Company, Glendale, California. In this capacity he will contact all original equipment manufacturers, jobbers and dealers in coordination with the branch office personnel in the use and sale of the refrigeration line of automatic control equipment.



J. M. SCHLEMMER

Mr. Schlemmer comes to General Controls with a very versatile background of 20 years experience in the refrigeration field. Starting with Frigidaire in 1925, as field and service engineer, he later was associated with a California refrigeration jobber organization. In 1938 Mr. Schlemmer and associates started manufacturing deep freeze boxes and allied equipment. This business was terminated by the war in 1941. He has also been associated with General Electric Company in their air conditioning and refrigeration divisions.

Mr. Schlemmer is an associate member of the American Society of Refrigeration Engineers, and is past President of the Golden



SECTION OF COMMERCIAL TRADES' SHOP

## TRAIN WHERE THE ARMY TRAINED

Learn Domestic and Commercial Refrigeration  
and Air Conditioning Maintenance & Service.

Full or part time Residence course or  
Combination Home Study & Shop training.

**VETERANS** - Commercial Trades Institute  
is approved for GI training

*Write for free Descriptive booklet*

## COMMERCIAL TRADES INSTITUTE

CHICAGO, ILLINOIS  
209 W. Jackson Blvd.

BIRMINGHAM, ALA.  
200 S. 20th St.



## STOP-FIRE IT'S A MUST IN EVERY SHOP

The most efficient exting-  
guisher manufactured

### FEATURES

- ★ Leak Proof
- ★ Protected Nozzle
- ★ Brass Shell
- ★ 35 ft. Discharge
- ★ Patented Seal in Handle
- ★ Non-Deteriorating Gasket
- ★ Double Action Pump
- ★ Head-Handle Nozzle
- ★ Solid Brass Forging
- ★ Evaporation Proof
- ★ Panic Proof Handle

### APPROVED BY

Underwriters Laboratories, Inc., Fire Department,  
City of New York, Factory Mutual Laboratory,  
Board of Standards and Appeal, and Board of  
Transportation. COMPLIES WITH FEDERAL, STATE  
and INTERSTATE COMMERCE REGULATIONS.

Price To Trade \$8.95 postpaid (Ceiling \$15.00)

## TEDWARD COMPANY

(Manufacturers Representative)  
4016 Church Ave., Brooklyn 3, N. Y.

*Says* **GASKET JOE**

HERE'S  
YOUR  
QUESTION-  
ALWAYS  
ASK IT!

"DID I LOOK  
AT THAT  
DOOR  
GASKET?"

**JAROW PRODUCTS**  
420 N. LA SALLE ST. CHICAGO 10, ILLINOIS



# STANGARD

## Prime Surface COLD PLATES



For Maximum Refrigerating Efficiency

**THE STANGARD DICKERSON CORP.**

46-76 Oliver Street • Newark 3, N. J.

Gate Chapter of the Refrigeration Engineers Society.

The appointment of Robert C. Allen, Jr. as Manager of the Kansas City, Missouri, Factory Branch was recently announced by J. F. Ray, Director of Sales.

Mr. Allen will devote his entire time to serving users of automatic pressure, temperature and flow controls in Missouri, Kansas, Eastern Nebraska and Western Idaho.

Mr. Allen was in the Army for 3½ years, spent 27 months overseas with the 9th Air Force as an electrical specialist attached to a squadron of B-26 Marauder bombers.

\*\*\*

### ELECTROCHEMICALS APPOINTS S. G. BAKER ASST. GEN. MANAGER

**A**PPPOINTMENT of Samuel G. Baker as assistant general manager of the Electrochemicals Department of the Du Pont Company is announced by F. S. MacGregor, general manager. Mr. Baker has been director of the Electroplating Division of the department.

Milton Kutz, who has been acting assistant general manager, becomes a special assistant to Mr. MacGregor.

A native of Tacoma, Wash., Mr. Baker first joined the Du Pont Company as a worker on a powder production line. Later he was graduated from the University of Washington with a degree in chemical engineering and rejoined the Du Pont Company as a chemist in 1925. In the Explosives Department, he served successively in production and sales work and in 1939 he became director of sales of the department. Four years later he joined the Electrochemicals Department as director of the Electroplating Division.

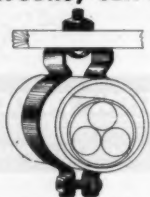
Mr. Kutz's career in the chemical industry began in 1897. That year he joined the Roessler and Hasslacher Chemical Company as an office boy, rising in 33 years to vice-president and a director of the firm.

When Roessler and Hasslacher was acquired by Du Pont in 1930, he became director of sales. In 1933 he was assistant general manager of the department. Illness forced him to take an extended leave of absence in 1941. Since Jan. 1, 1943 he has been acting assistant general manager.

## MINERALLAC

Steel HANGERS, CLIPS, STRAPS

OUTSERVE!



OUTLAST!

Minerallac Cable, Conduit and Messenger Hangers are STEEL. Easier, quicker to install; permit speedy, compact wiring; economical. Also in Everdur... Porcelain Insulating Bushings available.

Jiffy STEEL Clips (Pipe-clamp) require only one screw, nail or bolt; rib-strengthened; for hanging pipe, conduit, EX cable, mounting coils, etc. Millions in use.

Steel Straps for Messenger-cable services on outlet boxes; may be used in conjunction with hangers.

Order from your Electrical Wholesaler. Send for literature.

**MINERALLAC ELECTRIC COMPANY**  
25 North Peoria Street Chicago 7, Illinois

## Finds & Fixes LEAKS

### JUSTRITE 3-in-1 Detector Outfit

Quickly locates leaks in refrigeration systems using Freon, Carrene or other non-combustible halide gases. Just pass flexible sampling hose over system; torch flame burns blue when leaking gas is encountered.

Outfit includes torch (burning white gasoline, naphtha or benzine), detector hose, soldering point attachment and flame reducer for sweating small joints. Handiest tool ever made for refrigeration men. Ask your supplier about the No. 390 Justrite 3-in-1 Detector Outfit, or write:

**JUSTRITE MANUFACTURING CO.**  
2063 N. Southport Ave., Dept. B-7, Chicago 14, Ill.



WE are grateful for this opportunity to freely extend our best wishes for a

**Merry Christmas and  
a Happy  
New Year**

809 WEST 74TH STREET

*Automatic*  
**HEATING & COOLING SUPPLY**  
(DIVISION OF WEIL-McLAIN COMPANY)  
647 W. LAKE ST. CHICAGO 6, ILL.

Phone, CENTRAL 2061

*Thank You!*

AIRO sincerely appreciates the loyal patronage and friendly cooperation given us by our customers and suppliers, alike, through the turbulent war years.

Now, at the beginning of a peaceful and productive era, we wish our many friends in the trade a most prosperous new year.

**AIRO SUPPLY CO.**

WHOLESALE ONLY  
2732 N. Ashland Ave., Dept. A  
Chicago 14, Illinois

**ARE YOU  
Equipping a new Serviceman**

**Equipping a new Truck**

**Going back into Service Work  
?**

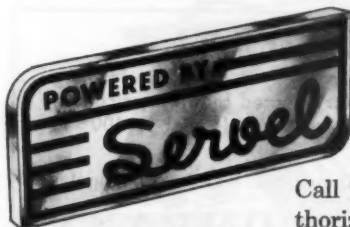
We have prepared a very helpful list of items suggested as a minimum stock. Several lists are available. Check the ones you want.

- ☐ Service Tools
- ☐ Parts for Domestic Service
- ☐ Parts for Commercial Service

Use your letterhead and send your inquiry to Dept. A.

**T  
H  
E  
R  
C  
O  
M  
P  
A  
N  
Y  
A  
L  
I  
N  
C.**

St. Paul, 4, Minn.  
University at Raymond  
Milwaukee, 3, Wisc.  
749 No. Seventh St.  
Des Moines, 8, Iowa  
106 Eleventh St.  
Cedar Rapids, Iowa  
503 Fourth Ave. S.E.  
Great Falls, Mont.  
306 First Ave. South



means reserve power to meet peak load demands. Use genuine Servel parts to maintain top efficiency.

Call your local Servel distributor or authorized parts jobber.

Electric Refrigeration Division

**SERVEL, Inc.** Evansville 20, Indiana

Wishing you a  
**Merry Christmas**  
and  
**Happy New Year**

**CHASE REFRIGERATION SUPPLY CO., Not Inc.**  
546 W. 119th St. Chase Building Chicago 28, Ill.

## **REFRIGERATION**

**Parts  
Supplies  
and Equipment**

★ ★ ★ ★

**Complete Stocks  
Latest Prices**

★ ★ ★

**SEND FOR OUR NEW  
CATALOG—JUST ISSUED**

★ ★

**Mail Order Inquiries  
solicited**

**A. E. BORDEN CO.**  
142 High St., Boston 10, Mass.

## **Control REPAIR SERVICE**

We completely disassemble controls, clean, test, check and replace defective or broken parts, adjust and set for proper temperatures.

Domestic Cold Controls (Modern).....\$2.25  
Commercial Controls (Pres. or Temp)..... 2.75  
90 day guarantee ★ Prices F.O.B. Chicago  
Prompt ★ Efficient ★ Reliable Service

**Refrigeration Control Service**  
(Not Incorporated)

4840 S. Springfield Ave., Chicago 32, Ill.

## **WEST COAST CONTROL SERVICE**

**Cold Controls • Pressure Switches**

**One year guarantee  
on all repairs**

**Original Factory Specifications**

**UTILITY THERMOSTAT CO.**  
4011 Halldale Ave., Los Angeles 37, Calif.

## **PUT RUST TO WORK!**

Brush or spray Nobs Glazecoat directly on rust. Rust aids in forming a permanent thermo-plastic coating that is not affected by water, alcohols, dilute acids, or alkalis. Prevents further rusting. Stands heat to 400° F. Covers about 300 sq. feet per gallon.

Price.....\$3.50 per gal. F.O.B. Los Angeles

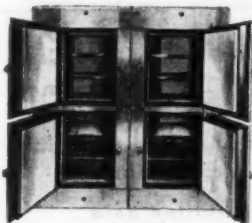
**NOBS CHEMICAL COMPANY**

2465 East 53rd Street, Los Angeles 11, Calif.

Seattle

San Francisco





**ZEROSAFE**  
Model FF-60. Cap.: 60 cu. ft.  
SIZES FOR EVERY NEED.

## YEARS AHEAD . . .

ZEROSAFE by Wilson is the **FIRST** and **ONLY** Reach-In Farm Freezer **PROVED** by years of use since 1939 to have

- Capacity for Full-scale home freezing and storing of foods
- Rugged strength for constant Daily Use Year After Year
- Convenience of Design For Real Usability

Write Dept. 14 for Details NOW:

**WILSON REFRIGERATION, INC.**  
DIVISION WILSON CABINET CO., SMYRNA, DEL.



**SEND FOR**  
*Latest*  
**CATALOG**

*Now*  
**G & E**  
**EQUIPMENT**  
**SUPPLY COMPANY**  
400 N. Sangamon Street  
CHICAGO 22, ILL.

Catalog No. 115

Remanufactured  
**AIR-COOLED**  
**CONDENSING UNITS**  
1/4 H.P. to 1 1/2 H.P.  
COMPLETE WITH SINGLE PHASE  
MOTORS

60 Cycle 110-220 V.

ALSO

**FROSTED FOOD CABINETS**

**EDISON COOLING CORP.**

310 E. 149th St. N. Y. 51, N. Y.

*Ask Your Jobber for*  
**HASCOBILT**  
*Parts*  
**SUCTION**  
*and*  
**DISCHARGE**  
**VALVE, DISC, REEDS**  
*and* **SPRINGS**  
for Conventional and Hermetic Type Compressors

If your jobber can't supply you, send for illustrated catalog and price list.

**HASCO, INC.**  
GREENSBORO, N. C.



**THE HARRY ALTER CO.**

★ 1728 S. Michigan Ave.  
Chicago, Ill.

Two Big Warehouses  
to Serve You

★ 134 Lafayette St.  
New York, N. Y.

## THE ANSWER TO YOUR HELP PROBLEM

We have available "REFRIGERATION SERVICE MEN" trained in our school shops and laboratories. Resident Students only. These men have a sound technical and practical knowledge of refrigeration.

Approved  
for  
**G. I.**  
training

*Write us when you need skilled help*

**BOSTON TECHNICAL INSTITUTE, SCHOOL OF REFRIGERATION**  
4707 Euclid Ave. Cleveland 3, Ohio

## GASKETS



*Write for complete  
catalog.*

• Play safe and specify CHICAGO-WILCOX gaskets for every refrigeration need. Our complete gasket service provides a dependable source of supply to meet your requirements. Get full details today.

**CHICAGO-WILCOX MFG. CO.**  
7701 Avalon Ave. Chicago 19, Illinois

## CONTROL REPAIR SERVICE

Domestic Controls reconditioned equal to new at a small cost. All work guaranteed for one year. Prices upon request.

**United Speedometer Repair Co.**  
342 W. 70th Street  
New York City 23

## BESTOLIFE LEAD SEAL JOINT SEALING AND ANTI-SEIZE PIPE JOINT COMPOUND

'BESTOLIFE has been used successfully in the Refrigeration Industry for years.

'BESTOLIFE is non-corrosive and non-expanding. It takes the place of litharge and glycerine. Does not harden or dry out. Protects threads, keeps pipe joints tight yet easily broken apart.

Prove 'BESTOLIFE'S efficiency for yourself. Trial 1 1/4 pound can sent anywhere in the U. S. for \$1.00. This charge cancelled if not entirely satisfactory.

*Manufactured Exclusively By*

**I. H. GRANCELL**  
1601 E. Nadeau St., Los Angeles 1, Calif.

## Previews of Our 1946 CATALOG

Will Be Released Sometime in March

Featuring a Complete Line of

Refrigeration Units,  
Parts & Supplies  
Electric Motors and Motor Parts  
BRUNNER Condensing Units  
KELVINATOR HERMETIC  
Units and Parts  
LYONS Metal Shop Equipment  
SKILSAW Electric Hand Tools  
B46-Bulletin Now Off the Press

*Write For Your Copy Today  
Wholesale Only*

## SERVICE PARTS COMPANY

2511 Lake St.

Melrose Park, Ill.

# FLOCO EXPANSION VALVES

Floco thermostatically controlled expansion valves have the patented, exclusive *Slip-in, Slip-out* valve cage assembly. Improved valve cage eliminates all gasket washers at all joints.

*Floco Valves • Flocheck • Flotubes*

**FLOW CONTROLS, INC.**

1821 W. North Ave., Chicago 22, Ill.

## AUTOMATIC EXPANSION VALVES

repaired or exchanged  
at \$1.75 F.O.B. Chicago



Until further notice we will be unable to accept other types of repair work.

ALL WORK GUARANTEED FOR 90 DAYS

**NEW DUTY**

2424 Irving Park Blvd., CHICAGO 18

## In the West It's REFRIGERATION SERVICE INC.

Pacific Coast Supply Jobber  
Since 1928

Your letterhead will bring our latest  
catalog—also our House Organ,

"The Liquid Line"



3109 Beverly Blvd.  
LOS ANGELES 4, CALIF.



... thanks each of you for your loyal patronage and excellent co-operation in the past. We are proud to extend our ...

**Season's Greetings  
and Congratulations**  
to

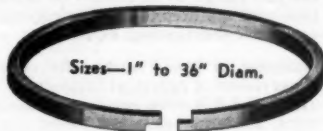
all of you, our new and old friends  
in the refrigeration industry



SERVICE ENGINEER



Our record of repeat orders that have come to us year after year from many firms is something of which we are very proud. It is due to the fact that down through the years we have produced the kind of rings that



Sizes—1" to 36" Diam.

satisfied our customers. AUTO-DIESEL "Ladle Tempered" Piston Rings are used as original equipment and replacement for Diesel powered units of all types—stationary and mobile units and hydraulic and pneumatic operated industrial equipment.

Write for information

**THE AUTO-DIESEL PISTON RING CO.**

3157 Superior Ave.

CLEVELAND 14, OHIO

**QUALITY RINGS SINCE 1921**



**UEI**

**A Leader in Training Men**

*in* **AIR CONDITIONING**  
*and* **REFRIGERATION**

**UEI**  
FOUNDED 1927

During the past twenty years Utilities Engineering Institute has opened its doors to ambitious men who sought for fundamental knowledge that would prepare them to enter the fields of Air Conditioning and Refrigeration.

For these students U.E.I. provided thoroughly competent training by practical and experienced teachers who know the full range of problems of installation and maintenance of refrigeration and air conditioning equipment.

Studying at home under the capable supervision of practical instructors and using U.E.I.'s own modern, authentic texts, students learn the basic, under-

lying principles of refrigeration and air conditioning and their practical application in all types of installation and service problems.

Thoroughgoing home study is followed by practical training in the great U.E.I. resident school, where students actually practice on real equipment under expert guidance. *This is the famous U.E.I. Balanced Training plan.*

U.E.I. is proud of the part it has played in opening the way to men interested in careers in these growing fields and for the service these men are rendering the industry and its customers throughout this nation and in other countries.

..... **UTILITIES** .....

**ENGINEERING INSTITUTE**

Placement Service for employers and graduates without charge

1314 W. Baldu Avenue, Dept. 45, Chicago 14, Ill.

**REFRIGERATION TRAINING SINCE 1927**



# VOLUME INDEX

January to December, 1945

Volume Thirteen

**T**O facilitate the location of articles which have appeared in **THE REFRIGERATION SERVICE ENGINEER**, this index is a regular feature in each December issue, serving as a ready reference of the articles and subject matter which have appeared in the preceding twelve issues. The figure following the date of issue refers to the page on which the article will be found.

## A

Air Conditioned Candy Cabinet.....	June-62
Conditioned Spiders on War Jobs.....	Mar.-48
Conditioned Trolley Coach Introduced in Atlanta.....	Sept.-48
Conditioning Increases Plane Production.....	Mar.-52
Conditioning Industry Predicts Huge Post-war Expansion.....	June-43
Airtemp Conditioners, Installation and Operation of.....	Sept.-27, Oct.-25, Nov.-25, Dec.-31
ASRE Cancels Spring Meeting.....	May-30
Headquarters Moved.....	May-32
Holds Annual Meeting.....	Jan.-44
to Publish Abstracts.....	Feb.-48
Appliance Stores, G. E. Suggests Layout For.....	Nov.-52
Army Operates Refrigerated Storage in Normandy Cave.....	Apr.-38
Refrigeration Specialists Study Food Service Program.....	Apr.-40
Refrigeration Units Demonstrated at Food Service Conference.....	Mar.-46
Avco Takes Over Crosley.....	Aug.-64

## B

Book Review:	
Drake's Heating, Cooling and Air Conditioning Handbook.....	Oct.-35
Electrolytic Capacitor.....	Sept.-46
Lessons in Arc Welding.....	Dec.-54
Building Contractor Charged with Diverting Units.....	Feb.-30
Bush, John, Opens Own Service Business.....	June-66
Business for Yourself. So You Want to Get Into, by Paul B. Reed.....	Jan.-27, Feb.-30, Mar.-30, Apr.-26, by Harry D. Busby.....
	July-26, Aug.-27, Sept.-23

## C

Census Bureau Report, Shipments of Commercial Air Conditioning and Refrigeration Equipment-1944.....	Sept.-33
Central States Refrigeration Supply Jobbers Meet.....	Mar.-72
Charge, Service, Determining Rate of.....	Nov.-42
Cheap Competition.....	Sept.-19
Cleveland Electrical League Discusses Air Conditioning.....	Jan.-38
Code, New Refrigeration, Detroit, Excerpts from.....	Oct.-52
St. Louis Building, Refrigeration Section.....	Aug.-45
Coldspot Electric Refrigerator, Construction, Operation and Servicing.....	Jan.-20, Feb.-26, Mar.-26, Apr.-29, May-28, June-33, July-35, Aug.-37
Commercial Air Conditioning and Refrigeration Equipment-1944 Shipments.....	Sept.-33
Commercial Refrigeration, University Offers Extension Course in.....	Jan.-29

Compressor Group Forms New REMA Division.....	May-68
Condensing Unit Manufacturers Appeal to WPB in Reconversion Program.....	July-25
Complete Organization Group.....	July-60
Converting Mills Ice Cream Cabinets to Farm Freezers by L. K. Wright.....	Jan.-24
Coolers at Supply Outposts.....	Jan.-39
Copper Production, Deficit of.....	May-52
Cylinder Regulations, Jobbers Complying with I.C.C.....	Sept.-50

## D

Data, How to Submit by R. L. Hendrickson.....	June-31
Dehydration of Refrigeration Parts with Air by R. L. Hendrickson.....	Apr.-23
Design Factors of the Commercial Hermetic by Carl Olin.....	July-30
Determining the Rate of Service Charge.....	Nov.-42
Dispatcher, The.....	Nov.-88, Dec.-88
Domestic Refrigerator of the Future.....	Feb.-35
Domestic Service Streamlined by Commercial Service Company by Robert Latimer.....	Apr.-35

## E

Electronic Device Speeds Defrosting of Frozen Produce.....	July-50
Excerpts from Detroit's New Refrigeration Code.....	Oct.-52
"Extra Touches" in Domestic Refrigeration Service by Robert A. Latimer.....	Nov.-45

## F

Fall of Germany May Increase Refrigeration Demand.....	Apr.-50
Farmer Knows Value of Refrigeration.....	Apr.-43
Farm and Home Freezers Association Meeting.....	Mar.-52
Farm Freezers, Converting Mills Ice Cream Cabinets.....	Jan.-24
Floating Refrigerator of Concrete Aids Pacific Invasion.....	May-36
Floods and Water Shortage.....	July-54
Food Stores Plan to Buy Refrigeration Equipment.....	May-36
Fountain Manufacturers Organize.....	Aug.-68
Freeze First-of-the-Season Vegetables.....	Sept.-46
Frigidaire Advanced Training Course for Servicemen.....	Jan.-42
New, Comes Off Line.....	Aug.-62
Frozen Dough, Neighbor Baker Sells.....	Aug.-40
Food Cabinets in Postwar Stores.....	June-46
Foods Cabinet, Self-Service.....	Feb.-48
Food Institute, Department Stores Form.....	May-50
Future of Refrigeration Service.....	Dec.-42

## G

G.E. Suggests Layout for Appliance Stores.....	Nov.-52
--	---------

## GOVERNMENT BUREAUS—NEWS AND RULINGS:

Appliances Exempted From Inventory Restrictions	Nov.—24
Applications for Construction and Equipment	June—22
Backlogs Delay Flow of Products to Civilian Users	Aug.—24
CMP Regulation 9A Amended	Mar.—20
9A Tightened	May—22
9A Tightened	June—24
9A and Order P-126 to Expire September 30	Sept.—35
California Repair Shops Must Itemize Repair Bills	Aug.—66
Carbon Dioxide Gas, WPB Considers Allocation Order	Apr.—21
Ceiling Price Adjustments for Electrical Controls	Apr.—22
for New Refrigerators	Oct.—48
on Small Motors Raised	Oct.—48
Civilian Items Held to 1944 Level	Jan.—18
Condensing Units and Materials	Apr.—21
Construction Order L-41 Amended	June—23
Conventions Are Restricted	Feb.—20
Copper Wire, Methods of Obtaining	June—23
Dealer's Priority Suspended	Feb.—48
Deferment Method for Refrigeration Repairmen Quick Action Essential	Mar.—56
Deferment Status of Key Employees, No Changes in	June—60
Discontinuance of Priorities Forecast for Civilian Production	July—22
Distribution of Household Refrigerators Still Restricted	Sept.—35
Electric Motors Still Critical	Mar.—19
Evaporative Coolers Eligible for Price Increases	Apr.—21
Fluorspar Still Scarce	Mar.—20
Fractional Horsepower Motors	Jan.—17
Freon Production Increased	Feb.—19
Restrictions Lifted	Apr.—20
Restrictions Off	May—22
Goods May Return to Civilian Markets	Apr.—22
Hand Tool Supply	July—24
Ice Refrigerator Production, Delivery of Materials Will Delay	Jan.—18
It's Getting Tough Again	Feb.—19
L-38 Revoked! Now What?	June—20
Limitation Order L-S-D Revoked	Oct.—48
Limited Priorities Assistance for Manufacturers for Last Half of 1945	July—23
Materials Released to New Manufacturers	June—24
Maximum Refrigerator Prices in Canada	Mar.—20
Mechanical Refrigerators Scheduled; Repair Parts Have Preference	June—21
More Copper Available	Aug.—26
Motor Limitation Order Revoked	Aug.—25
Motor Makers Given More Time to Order Parts	Mar.—19
Motor Procurement Explained	Feb.—20
New Regulations for Prewar Refrigerators	Oct.—50
Newcomers to Receive Production Materials	July—24
No New Condensing Units or Low Sides Ratings Allowed Under P-126	May—22
No Supplemental Allocations	July—23
No Tin for Current Reconversion	Aug.—25
OPA Asks Injunction Against Repair Firms	Jan.—46
Cities Cincinnati Firm	May—44
Rulings, J. P. Holds Invalid	Mar.—50
Order L-38	Feb.—19
Price Control of Repairs Based on Hourly Rate	May—21
Priorities Assistance for Production of Mechanical Refrigerators	July—23
Production of Small Motors	July—24
Ratings for Motor Repair	July—24
Reconversion Policies Amplified	June—22
Reconversion Policy Announced	Apr.—20

## Government Bureaus, Continued:

Records on Sales of Government Surplus Property	Apr.—22
Refrigerated Display Cases	Mar.—19
Refrigeration Production Increased, Authorization of	Aug.—25
Refrigerators to be Sold Only to Most Essential Purchasers	May—20
Spot Authorization Plan Restored	May—21
Spot Authorization Production for Last Quarter	Apr.—21
Tire Allowances Reduced	Jan.—18
Tire Scarcity, Warnings of	Apr.—20
Trucks, Motor, Supply Drastically Reduced	Jan.—17
Trucks, Other Items Released—Industrial Construction Unlimited	Sept.—35
Wage or Salary Rate Increases	Jan.—18
WPB Allocates Materials for Refrigeration Repair Parts	May—21
War Production Comes First	Jan.—17
Government Charges Diversion of Cooling Units	June—24
Government Loans, New Policies to Manufacturers	June—25
Guesswork Eliminated in Freezing Plants	Feb.—50
Gun Turrets Tested in Stratosphere Chamber	Mar.—72

## H

Hansen, Frank, Arrives in U. S.	June—62
Heat Pump Idea 93 Years Old	Apr.—28
Home and Farm Freezers by C. W. Stoner	Apr.—56
Ready for Expanded Market	Oct.—29
Home Built Farm Refrigeration	Mar.—50
Home Freezer Market Exaggerated Says Frigid-aire Head	Jan.—40
Lockers to Sell	June—44
and Coolers, Maximum Prices	Aug.—26
Westinghouse	June—56
Hood, F. J., New REMA President	June—86
Hurricanes in a Vacuum	Apr.—50

## I

Ice Cream Cabinet Standardization, Consider	Mar.—72
Industry Starts Rolling, The	Oct.—36
Installation and Servicing of Refrigerating Equipment by S. A. Cole	June—26

## J

Jobber in Modern New Store	Apr.—39
Modernizes Store	Feb.—52
Jobbers Association Votes Name Change	Nov.—52

## K

Kelvinator Builds First Ice Cream Cabinets Since 1942	Sept.—42
Kromer, W. R., Chairman N.R.S.C., Submits Resignation	May—27
Report Shows Manpower Shortage	Apr.—50

## L

Locked Rotor Rating for Residential Service	Nov.—52
Locker Association Predicts 5,000 New Plants	June—64
Plant Being Built by R.S.E.S. Member	June—66
Plant, Experimental, Opened in Ithaca, N. Y.	June—45
Low Temperature Refrigeration, Some of the Problems by S. R. Hirsch	Feb.—21



## M

Manpower, Critical Commodity.....	Feb.—25
Massachusetts Extension Officers Courses in Refrigeration .....	Sept.—50
Measuring Kink, An Accurate.....	Aug.—64
Mechanical Refrigerators, Consumer Demand High for .....	June—62
Merger of Sunbeam and Seeger Proposed.....	May—52
Mills Ice Cream Cabinets, Converting to Farm Freezers .....	Jan.—24
Mills Freezer Servicing.....	Mar.—43
Milwaukee May License Service Men.....	Mar.—48
Model, Model—Who Can Find the Model Number .....	Aug.—66
Motor Pulleys Need Improving by <i>W. E. Patten</i> .....	Nov.—33

## N

National Refrigeration Service Council Dissolves .....	June—86
Service Council Recognizes Contributions Made by Government Bureaus.....	July—56
Supply Jobbers Association Appoints Full Time Secretary.....	Jan.—46
Supply Jobbers Association Opens Cincinnati Office .....	Feb.—50
Naval Training School Closes—Transferred to Norfolk .....	Aug.—60
Nevada Survey Shows Big Market for Refrigerators .....	May—44

### NEW AND IMPROVED APPLIANCES

Adjustable Capillary Tube.....	Dec.—72
Armstrong Wheel Fuller.....	June—82
Blue Flash Cools Return.....	Dec.—70
Charging Hose and Connections.....	Sept.—68
Charging Line for Refrigerants.....	Oct.—62
Cold Water Faucet.....	Oct.—60
Copper Plating on Aluminum.....	Apr.—84
Cutting Tool Grooves Plastic.....	Dec.—68
Drill Grinding Jig.....	Feb.—64
Easy Reciprocating Electric Sander.....	Oct.—60
Electrode Holder .....	Jan.—60
Electronic Relay Controls 30 Ampere Outlets .....	Aug.—80
Flexigrip Tubing Fitting.....	Dec.—72
Frigidaire Home Freezer.....	Dec.—70
Frozen Food at Touch of Button.....	Nov.—70
Heat Dissipating Unit.....	Nov.—70
High Capacity Portable Insulation Tester .....	Apr.—84
Home Freezers, New, Announced by Westinghouse .....	Aug.—80
Hose Clamps, Stainless Steel.....	Jan.—60
Hydraulic Packing .....	July—72
Improved Test-Lite .....	Nov.—72
Kaynar Anchor Type Lock-Nut.....	Oct.—60
Logan Quick Change Gear Cabinet Lathe .....	Feb.—64
Machinist's Vise .....	July—72
Mills Direct-Drive Compressor.....	Oct.—62
Miniature Oiler .....	Nov.—72
New Air Duct.....	Dec.—72
New Low-Priced Welder.....	Dec.—68
Nip-Grip .....	Nov.—72
Oil, Removing from Refrigerant Gas.....	June—84
Paint Remover .....	Jan.—60
Pilot Control, Flocheck.....	July—72
Pneumatic Hammer for Metal Working.....	Sept.—68
Recording Thermometers, Portable, Again Available .....	July—72
Self-Locking Driv-Lok Pins.....	June—82
Synthetic Resin Adhesive.....	Jan.—60
Tachometer, Standard Machinery Co. .....	Feb.—64
Tape, No Drip, Condensation Drip Stopped by .....	June—82
Thermostatic Expansion Valve.....	Nov.—70
Tools, Flexible Shaft, for Corners.....	June—82
"Trap-Dri" Combines Fitter and Dryer.....	June—84
Unit Helps Preserve Freshness of Foods.....	Apr.—84
Visoleek Tag Instructs Owners.....	June—84
Water Coolers Back in Production.....	June—84
Wheel Puller, Armstrong.....	June—82

New Locked Rotor Rating for Residential Service .....	Nov.—52
---	---------

## O

Opportunity of Sales Through Service, The, by <i>W. A. Matheson</i> .....	Nov.—21
Over-Fusing Causes Fires.....	July—54

## P

Pacific Icebox Preserves Food for Fleet.....	Aug.—66
Plastic Tubing for Soda Fountains.....	Nov.—58
Power from Atomic Energy.....	Sept.—42
Predictions and Trends for 1945.....	Jan.—19
Price Regulation on Used Refrigerators Amended—Later Models Added.....	Aug.—32
Prince of Iraq Selects American Hunting Lodge on Wheels .....	Nov.—56
Priority Merchandising Plan Has Its Drawbacks .....	Apr.—39

## Q

Quartermaster Corps Develops Portable Ice Cream Machine .....	Apr.—45
Develops Portable Refrigerator.....	Sept.—48

### QUESTIONS AND ANSWERS:

Acid for Cleaning Stuck Compressor.....	May—35
Aluminum in Older Models.....	June—52
Apex Used Universal Cooler.....	July—44
Beer, Trouble in Drawing.....	June—50
Broken Compressor Valves.....	June—47
Capacity Based on Suction Pressure.....	May—35
Capillary Tube Oversize.....	Nov.—64
Tube Sizes .....	June—52
Carbon Dioxide for Drying.....	May—34
Carbon-Tet in SO <sub>2</sub> .....	Dec.—41
Change to F-12 Unbalances Seal Spring.....	Oct.—42
Changes from SO <sub>2</sub> to Methyl.....	Mar.—42
Changing Frigidaire from Water to Air Cooled .....	July—44
Multiple System from SO <sub>2</sub> to F-12.....	Aug.—52
to Automatic Expansion Valve.....	Jan.—35
to Direct Expansion.....	May—35
Cleaning and Converting Stuck System.....	Oct.—43
Coil Arrangement in Cooler.....	Feb.—36
Comments on Question 545.....	Feb.—36
Question 629 .....	Jan.—34
Question 636 .....	Feb.—36
Question 641 .....	May—33
Question 651 .....	May—33
Question 659 .....	June—47
Question 670 .....	Aug.—52
Comments on Question 719.....	Dec.—40
Condensing Unit, Operating One in a Parallel Hook-Up .....	June—47
Connecting for F-12 Transfer.....	May—34
Converting Ice Box to Mechanical Refrigerator .....	June—50
Cooler Calculations .....	Aug.—52
Copeland, Brine for .....	June—54
Brine Tank Solution.....	Feb.—39
Correction for Question 644 .....	Apr.—41
Cross Connecting Units.....	Sept.—38
Dayton, Parts for .....	June—50
Dead Spots in R. I. Motors.....	Mar.—39
Defrosting Fin Coils.....	Aug.—58
Dehydrating Majestic .....	Aug.—52
Delphos Parts Not Made.....	Mar.—39
Display Case Will Not Work.....	Apr.—42
Drying Oven .....	July—39
Egg Storage Conditions.....	Aug.—56
Evaporator Frost Problem.....	Jan.—35
Trouble on Multiple System.....	July—39-42
Expansion Valve Location in Frozen Food Cabinet .....	Apr.—42
Servel Hermetic .....	Nov.—68
Extreme Condenser Cooling.....	Feb.—39
False Sight Glass Reading.....	Feb.—39
Fedders Float, Removing.....	July—42
Find the Leak!.....	Aug.—54

## Questions and Answers, Continued:

Freezer Problem .....	June-54
Grunow Erratic Operation .....	Apr.-41
Evaporators Will Not Hold Higher Pressures .....	Aug.-54
Transformer, Check .....	Sept.-39
High and Low Temperature Units Are Same Design .....	July-44
High Head Pressure After Long Shut-Down .....	Sept.-38
Continuous Running, and .....	Oct.-43
High Pressure Bellows Cracks .....	Aug.-56
Ice Cream Hardening Problem .....	Jan.-34
Improper Carrene Meter .....	Nov.-68
K Factor of Coils and Heatload Figures .....	July-39
Kelvinator Brine Tank System, Adjusting .....	June-52
Leak Causes High Head Press. ....	Sept.-49
Majestic Stuck .....	June-54
Mold in Cooler .....	May-34
Montgomery Ward Pump Oil .....	Dec.-40
More Information on Question 641 .....	Mar.-39
On Question 687 .....	Oct.-42
Norge Change-Over Problems .....	Apr.-42
Should Cool 80 Cubic Foot Refrigerator .....	Oct.-46
Two-Temperature Charge .....	Jan.-35
Oil Problem in Multiple Unit Installation .....	Mar.-42
Operating Head Pressure .....	Feb.-39
Perpetual Motion—Almost .....	Nov.-64
Plate Coil Defrosting .....	Aug.-58
Pressure Test with CO <sub>2</sub> and F-12 .....	May-33
Purifying Methyl Not Practical .....	Feb.-38
Reaction of Galvanized Pipe in Ammonia System .....	Jan.-34
Refrigerant Not Identified by Switch Setting .....	Nov.-66
Used in Crosley .....	Apr.-42
Remodeling Majestic .....	Aug.-58
Removing Lenses from Pitch After Freezing .....	Oct.-46
Silica-Gel Dryer on Sulphur Dioxide System .....	July-42
Sweating on Freezer Walls .....	Oct.-43
Sealing Shell and Tube Condenser .....	Aug.-58
Thermal Unit No Longer Made .....	Oct.-42
Trouble After Repairs on Grunow Are Made .....	Oct.-46
Uneven Temperatures in Frigidaire I. C. Cabinet .....	Feb.-37
Units Not Rated in Cubic Feet .....	May-33
Universal Cooler Trouble .....	Dec.-40
Valve Capacity Rating .....	Nov.-64
Trouble on Freezer .....	Nov.-66
Ward Unit, Who Made? .....	Feb.-38
Water Freezes in Philco Thermostat .....	July-44
Welsbach Service .....	June-54
When to Change Dryer .....	Apr.-41

## R

Rasor, Emerson E. Meets Death in Plane Crash .....	Feb.-50
"Rebuilds" Builds Customers .....	Jan.-32
Reed, Paul, Appointed Council to Office of Chief of Engineers .....	May-52
Refrigerants—Physical and Refrigerating Properties, by Guy R. King .....	Nov.-35, Dec. 28
Refrigerating Equipment, Installation and Servicing by S. A. Cole .....	June-26
Refrigeration and Aircraft to Make New Fresh Foods Available .....	Nov.-51
REMA All Industry Exhibit Set for Cleveland, October 1946 .....	Sept.-66
Fall Conference Attracts Record Attendance .....	Dec.-52
Hood, New President .....	June-86
Observes Tenth Anniversary .....	Aug.-78
Starts Public Relations Program .....	June-68
Refrigeration Heat Loads, The Problem Is, by R. L. Hendrickson .....	May-24
Mechanic Tells About Service Overseas .....	Jan.-33
Motors, Fundamental Maintenance and Operation by J. A. McDonald .....	Sept.-31

Parts to Provide Huge Postwar Market .....	July-58
School Opened by Navy .....	Sept.-22
Section Included in New St. Louis Building Code .....	Aug.-45

## REFRIGERATION SERVICE ENGINEERS SOCIETY:

Birmingham Chapter Petitions for Charter .....	Feb.-54
Receives Charter .....	June-70
Chapter Directory .....	Sept.-52
Chapter Notes .....	Jan.-54, Feb.-54, Mar.-64, Apr.-78, May-56, June-70, July-66, Aug.-72, Sept.-60, Oct.-64, Nov.-82 .....
Chapters in the Making .....	Nov.-82, Dec.-56
Chicago Chapter Has Picnic .....	July-62
Cleveland Chapter Has Active Publicity Committee .....	May-54
Driskell, J. L., Overcome by Fumes .....	May-66
Goldberg, Herman, Party .....	Jan.-46
Houston Chapter Closes Charter .....	Jan.-52
Receives Charter .....	June-70
Illinois Association, Officers and Board Meet .....	Jan.-50
Illinois State Association Plans Fall Meeting .....	Aug.-72
8th Annual Convention .....	Nov.-76
Interprovincial Association Approves Apprenticeship Act .....	Sept.-56
Completes Plans for Annual Meeting at Montreal .....	Feb.-54
Meeting to be Held March 18-19 .....	Jan.-50
Conference, Annual .....	Apr.-52
Conference, Home and Farm Freezer, by C. W. Stoner .....	Apr.-56
Conference, Progress Service from 1920-1945, by Paul Reed .....	Apr.-62
Key City Chapter Gets Charter .....	Apr.-78
Ladies Auxiliary .....	Jan.-58, Feb.-60, Mar.-70, Apr.-82, May-66, July-70, Aug.-78, Sept.-66, Oct.-77, Nov.-86 .....
Lilley & Son .....	Sept.-66
Massachusetts State Association Forms New England Group .....	Jan.-52
Miami Chapter Charter Presentation .....	Nov.-81
Midwest Chapter Badges .....	Feb.-54
Milwaukee Chapter Petitions for Charter .....	Jan.-50
Monterey County Chapter Formed .....	May-56
New Chapter in St. Petersburg, Florida .....	Oct.-64
New Chapters Petition for Charters .....	July-64
Receive Charters .....	Sept.-66
New England Chapters, Officers Meet .....	May-66
States Association Formed .....	July-52
States Association Meet .....	Nov.-80
Plesskott, E. A., Retires As R.S.E.S. President .....	Feb.-52
Progress Service from 1920-1945 by Paul Reed .....	Apr.-62
Sacramento Valley Chapter Formed .....	May-56
San Diego Chapter, Cooperative Advertising .....	Mar.-62
Waterbury Area Petitions for Charter .....	Mar.-62
Chapter Charter Meeting .....	Nov.-74
Wisconsin State Association Organized .....	Mar.-64
Picnic Scheduled .....	July-62
Starts District Meetings .....	May-54
Youngstown Chapter, Public Service and Education Activities .....	Mar.-62
Refrigeration Service Has Grown Up by E. A. Seibert .....	Aug.-23
Service Men, Washington Requested to Defend Essential .....	May-27
Service School Completes First Year .....	Apr.-25
Shop, Cebu .....	June-64
Refrigerator Dealers Admit OPA Charges .....	Aug.-66
on Wheels .....	July-54
Owners Making Mistake by Neglecting Repairs .....	July-52
Rebuilt by G.I.'s on Leyte .....	Mar.-50
Refrigerators, First New, Going to Dealers .....	Dec.-23
Relation of Humidity to Practical Refrigeration .....	Nov.-29
Room Coolers, Sell on Trial Basis .....	Aug.-31
Ruxton's Refrigeration "Rebuilds" .....	Jan.-32

# S

Sacramento Schools Offer Refrigeration Training	Aug.—68
San Antonio Committee Drafts Ordinance	May—38
San Francisco Jobbers Meet	May—68
Seabees, Army Troops Pledge Friendship with Ice Water	May—31
Selecting Evaporator and Condensing Unit by D. D. Orr	Mar.—33
Self-Service for Frozen Food Buyers	Apr.—37
Sell or Go Bust by Harry Boyd Brown	Nov.—46
Selling Service with Service by Grier Lowry	Nov.—43
Service Behind the Servicemen	Oct.—23
Company Employs G.I.'s	July—34
Council Presents Testimonial to Paul McNutt of WMC	Mar.—60
Engineer Is Good	Mar.—29
Engineers Needed on Army Vessels	Oct.—35
Improvements Advisory Committee Undertakes Important Work	Apr.—47
Managers Express Concern Over Shortage of Trained Personnel	Mar.—54

## SERVICE POINTERS:

Adjusting Hot Wire Relay	Mar.—37
Automatic Belt Tightener	Feb.—34
Bellows Seal Repairing	Aug.—44
Capacitor Motor Testing Device	Mar.—38
Capillary Tube for M-W High Side Float	Apr.—34
Case of the Oscillating Pump, The	Dec.—38
Changing to Expansion Valve on Ward Unit	Mar.—38
Charging Sealed Units without Valve Kit	July—48
Checking the Charge in the Grunow-Adding Carrene	Feb.—33
Cleaning Copper and Brass	Feb.—34
Internal Strainer	May—32
Water Cooled Condenser	Sept.—37
Cold Pot for Cold Controls	Dec.—39
Coldspot Noise Elimination	Mar.—37
Oil Drain Pan	July—48
Valve Lapping and Cage Replacement	Apr.—33
Compressor Screen Plugged	June—40
Condenser Pressure Reduced	Feb.—33
Control Remodeling	June—39
Converting Frigidaire N & W to Methyl Chloride	Nov.—60
Converting Stewart-Warner to Methyl Chloride	Apr.—33
Cotter Pin Tool	Sept.—36
Dehydrating Method	Apr.—33
Economical Transmission for Remote Circuits	Sept.—36
Emergency Motor Mounts	Aug.—44
Emergency T.E.V. Operation	Jan.—31
Expansion Valve Bellows, Preventing from Freezing	May—32
Finding That Leak in Graybar	Oct.—40
Float, Defective, Works Automatic Expansion Valve	Sept.—37
Fluids for Air Conditioner Filters	June—39
Gaskets Cause Stuck-Up Compressor	Oct.—40
Gauge Reading May Be Misleading	May—32
Grunow Motor and Starter Trouble	Mar.—38
Obstructions	Sept.—36
Ingenuity Saved the Day	Nov.—41
Low-Temperature Hook-Up for Standard T.E.V.	Feb.—34
Moisture in Grunow	June—40
Not Always the Trouble	May—32
More on Condenser Auxiliary	Oct.—40
Moving Refrigerator Without Damaging Floor	Feb.—33
Muriatic Removes Calcium	Nov.—60
Oil Logging Stopped in Low-Side Float	Apr.—34
Open Valve With Torch	Nov.—62
Overcoming High Pressure on Air Cooled Machines	Aug.—44
Points to Observe in Grunow Service	Nov.—60
Portable Drying Unit	Aug.—43
Prest-O-Lite Tank Adapter	June—39
Preventing Valve Freeze-Up While Removing Moisture	Jan.—30

## Service Pointers: Continued:

Reconditioning the Inner Commutator Face	Apr.—34
Removing Broken Cap Screws	Jan.—30
Removing Oil from Evaporator	Sept.—37
Repair of Electric Motor	Oct.—41
Repairing or Remodeling Carrene Motors	Apr.—34
Grunow Compressor	July—46
Rigid Vise Support	July—48
Roller Bar for Heavy Moving	Jan.—30
Service Valve for Ward Unit	Mar.—37
Simple Twist of Wrist Repairs Motor	Oct.—40
Spring Handling Tool	Jan.—31
Stewart-Warner Diagnosis	Aug.—44
Substitutes for Hard-to-Get Rubber	Oct.—40
Testing Equipment	July—46
Testing Grunow Units	Nov.—62
Turn the Hinge Over	Dec.—39
Utilizing Worn Motor Brushes	Jan.—31
Wartime Substitution	Aug.—43
Service Today for Sales Tomorrow by P. V. Sprout	Sept.—21
Servicing the Mills Freezer by A. M. Savin	Mar.—43
Shipbuilders Study to Become Refrigeration Service Men	Feb.—46
Showmanship Will Be Needed to Sell Refrigerators in Potawar Market by Robert Latimer	June—41
So You Want to Get Into Business for Yourself by Paul B. Reed	Jan.—27, Feb.—30, Mar.—30, Apr.—26
by Harry D. Busby	July—26, Aug.—27, Sept.—23
Soldiers Plan for Future	Jan.—40
Southwest Jobbers Meet	Feb.—52
Sterilamp, Use of, for Perishable Foods	Feb.—42
Suction Pressure on Airtemp Equipment	Jan.—41
Survey on the Service Business by H. D. Busby	Mar.—21
Shows Banks Plan to Supply Consumer Credit	May—50
Suspension Order Issued Against Refrigeration Contractor	Aug.—26

# T

Testing Laboratory to Weatherproof Planes	June—64
Trade Practice Rules, Proposed, Made by Federal Trades Commission	July—54
Training Course for Servicemen	Jan.—42
Films on Service Now Available	July—54
Trip Through Deep Sleep, A	Dec.—36

# U

U.S. Patents of Enemy Aliens Offered for License	Apr.—32
University Offers Extension Course in Commercial Refrigeration	Jan.—29

# W

WPB Issues Suspension Orders Against Refrigerating Concern	July—52
WPB Suspends Firm	Apr.—50
Warton School in England	Dec.—35
Westinghouse Announces Home Freezers	June—56
Film Shows Service Methods	May—46
Opens Conservice Schools	Apr.—46
Refrigerator Models	Aug.—62
Why the Motor Doesn't "Jump"	Aug.—64
Wright Has Charge of Refrigeration School	Feb.—46

# Y

Yakima Dealer Advocates Neighborhood Location	Sept.—46
Yanks Have Ice, Thanks to Japs	Feb.—42
YMCA Schools Announce Courses in Refrigeration	Apr.—46

# INDEX OF ILLUSTRATIONS

## A

Adapter, Tank .....	June-39
Advertisement, Telephone Directory, San Diego Chapter .....	Mar.-62
Aeroquip Hose Fittings .....	Sept.-68
Aero-Seal Stainless Steel Hose Clamps .....	Jan.-60
Airtemp Conditioner .....	Nov.-26
Models .....	Sept.-27-28-29
Trouble Check Chart .....	Jan.-41
Airtron Air Duct .....	Dec.-72
Alaska Electric Light and Power Store .....	Sept.-76
Alter, Harry and Kromer, Ray .....	July-56
Alter, Major Arthur .....	Dec.-74
Alter Presents Mansure with Crosley Franchise .....	May-70
Arc Welder .....	Dec.-68
Army Freezer, Gilder-borne .....	Mar.-46
Outpost Cold Storages .....	Jan.-39
ASRE Luncheon .....	Jan.-44

## B

Badge, Mile High Chapter .....	Feb.-54
"Bantam Bully" Pneumatic Hammer .....	Sept.-68
Birmingham Chapter Banquet .....	July-70
Blueflash Cooler .....	Dec.-70
Brown Instrument Co., Veterans Accept Army-Navy Award .....	Mar.-76

## C

Cartoon (Ammons) .....	Mar.-36, Apr.-19, June-40, July-21, Aug.-21, Sept.-37
Cartoon-Capacity of Unit .....	Apr.-36
"Could I Show You Something Really Nice in a Refrigerator?" .....	Oct.-41
"Needs Defrosting!" .....	Nov.-62
Charging Rack for Service Drums .....	Sept.-26
Valve and Gauge Assembly .....	Oct.-28, Nov.-27
Chart, Compressor-Evaporator Balance .....	Mar.-35
Showing Heat Load .....	May-26
Chicago Chapter at Liquid Carbonic .....	June-74
Chilton, Bill, Oil Capital Chapter Picnic .....	Nov.-85
Cleveland Chapter Attendance Card .....	May-54
Christmas Party .....	Jan.-56
Coldspot Electric Refrigerator, Construction, Operation and Servicing .....	Jan.-20-22-23, Feb.-26-28-29, Mar.-27-28-29, Apr.-29-30-31-32, May-29-30-31, June-34-35-36-37-38
Oil Drain Pan .....	July-48
Valve Lapping and Cage Replacement .....	Apr.-33
Cold Water Faucet .....	Oct.-60
Conditioner, Descriptive photograph showing location of parts referred to in text .....	Oct.-26
Electrical Wiring Diagram for Single Phase, Model 3-SCD .....	Oct.-27
Electrical Wiring Diagram for the 2-phase and 3-phase, Models 3-SCD and 5-SCA .....	Oct.-28
Copeland Compressor for Air Conditioning Installed Inside an Attractive Cabinet Base .....	Nov.-56
Cutting Tool for Plaster .....	Dec.-68

## D

Dawson, Richard S. and Gary, Charles V. .....	Oct.-84
Dayton Chapter Officers and Picnic .....	Oct.-70
Dehydrating Oven, Construction Details .....	Aug.-29
DIAGRAMS AND DRAWINGS:	
Automatic Belt Tightener .....	Feb.-34
Cleaning Process .....	Aug.-29
Coil Arrangements .....	Feb.-37
Condenser Pressure Reduced .....	Feb.-33
Control Panel for Farm Freezer .....	Jan.-25
Cross Connecting Units .....	Sept.-38
Dryer .....	Feb.-36
Mills Freezer Servicing .....	Mar.-43

Motor Brush .....	Jan.-31
Oil Problem in Multiple Unit Installation .....	Mar.-42
Removing Broken Cap Screw .....	Jan.-30
Shop Arrangement .....	Sept.-25
Shop Layout .....	Sept.-26
Spray Booth .....	Aug.-31
Displacements of Common Refrigerants Graph .....	Nov.-39
Domelre Unit-About 1914 .....	Nov.-64
Driv-Lok Pin, Self-Locking .....	June-82
Drying Unit, Portable .....	Aug.-43
Dual Compressor Hook-up .....	June-47

## E

E-Z Holder .....	Feb.-64
Easy Electric Sander, Model XL50 .....	Oct.-60
Electronic Relay .....	Aug.-80
Expansion Valve .....	May-32

## F

Farm Storage and Freezer Room .....	Apr.-43
Flexigrip Coupling .....	Dec.-72
Flocheck, New Pilot Control .....	July-72
Floro Flotube .....	Dec.-72

### FREEZERS, HOME AND FARM:

Amana .....	Oct.-33
Ben-Hur .....	Apr.-58, Oct.-33
Coolerator .....	Oct.-34
Eco Cabinets (Model FTD-24) .....	Oct.-32
Frigidaire .....	Dec.-70
Frigid-Freeze .....	Oct.-33
Frosted Food-O-Mat .....	Nov.-70
Harderfreez .....	Oct.-30
I.C.A. Koldmaster .....	Oct.-31
Pak-A-Way .....	Oct.-32
Portable Freez-All .....	Oct.-30
Quillen .....	Oct.-34
Sanitary Quicfreez Model 1244 .....	Oct.-29
Steinhorst .....	Oct.-34
Weber Roll-A-Door .....	Oct.-31
Westinghouse .....	June-56, Aug.-82
Wilson .....	Oct.-32
Freez-O-Mat .....	Apr.-37
Frigid Dough Bakery Salesroom .....	Aug.-40-41
Frigid Dough Cooler Room .....	Aug.-42
Frigidaire, First Since 1942 .....	Aug.-62
Managers, "Viso-Trainer" .....	Jan.-42
Unit-About 1923 .....	Apr.-66
Frozen Food Cabinet .....	June-46
Frozen Food Cabinet, Self-Service Made by Hussmann .....	Feb.-48

## G

General Controls Plant .....	Apr.-88
General Electric Suggested Appliance Store Layout .....	Nov.-54
Goldberg, Herman, Christmas Party .....	Jan.-48
Golden Gate Chapter Meeting .....	Sept.-64
Grunow Capillary Tube .....	Apr.-34

## H

Heat Dissipator .....	Nov.-70
Higgins Appliance Division .....	Feb.-66
Hinshaw, R. L. in his office .....	Oct.-21
Honorable Ali Jawdat and daughter .....	Nov.-56
Hot Wire Relay .....	Mar.-37

## I

Ice Cream Machine Developed by Quarter-master .....	Apr.-45
Installation Layout .....	June-41
Insulation Tester, Portable .....	Apr.-84
Interprovincial Association Officers .....	Apr.-54
Iowa State Association, Formation Meeting .....	June-72

K	
Kansas City Chapter Dinner Dance.....	May-62
Kaynar Lock-Nut .....	Oct.-60
Kelvinator Ice Cream Cabinet.....	Sept.-42
Kelvinator Unit About 1922.....	Apr.-66
Kromer, W. Ray, and Alter, Harry.....	July-56

L	
Lapping a Seal.....	Aug.-28
Lathe, Logan Quick Change Gear Cabinet.....	Feb.-64
Lathe with Cabinet.....	Aug.-28
Locked Rotor Motor Test.....	Aug.-30
Locker Plant at Ithaca, N. Y. ....	June-45

M	
Machinist's Vise .....	July-72
Magnolia State Chapter; Newspaper Advertisement .....	May-60
Marine Refrigeration .....	May-37
McCombs Refrigeration Supply Store.....	Aug.-70
Mile High Chapter Annual Dinner.....	Mar.-66
Mills Direct Drive Compressor.....	Oct.-62
Monterey Chapter Charter Presentation Dinner Attendance .....	Nov.-81
Officers .....	Nov.-81
Montgomery Chapter Banquet.....	Jan.-54
Mor-Weld Electrode Holder.....	Jan.-60
Motor-Compressor Unit, Cut-Away View of the 3-HC .....	Nov.-28
Multnomah Chapter Banquet.....	Oct.-68
Temporary Officers .....	Oct.-68

N	
Narco Unit—About 1916.....	Apr.-64
National Refrigeration Service Council Delegations .....	Mar.-60
Ne-O-Lite Test-Lite .....	Nov.-72
Niagara Frontier Chapter .....	May-58
Annual Banquet .....	Sept.-62
Christmas Party .....	Feb.-58
Ladies Auxiliary Charter.....	Sept.-66
Officers .....	Sept.-62
Nip-Grip .....	Nov.-72

O	
Oberer, J. M., and Day, Ralph A. ....	Aug.-84
Obero Visits Ansul Chemical.....	Sept.-72
Officers, Refrigeration Equipment Manufacturers Association .....	July-58
Oil Capitol Chapter Picnic Views.....	Nov.-85
Oilout, Niagara Blower Co. ....	June-84
Oil-Rite Miniature Oiler.....	Nov.-72

P	
Parts Bins .....	July-29
Portable Refrigerator for Medical Corps.....	Sept.-48

#### PORTRAITS:

Anderson, J. J. ....	Aug.-86
Aulsebrook, W. J. ....	Jan.-66
Bachman, C. J. ....	May-74
Cashin, William .....	Feb.-76
Clothier, Van D. ....	Aug.-84
Coggin, F. G. ....	Apr.-92
Cunningham, Thomas .....	Feb.-74
Davis, G. C. ....	Nov.-90
Davis, R. E. ....	Jan.-66
Dube, John E. ....	Oct.-80
Dunning, N. M. ....	Dec.-74
Emde, Lud .....	May-76
Farrow, W. T. ....	Aug.-70
Geiersbach, Carlton G. ....	June-90
Gilbert, E. ....	Mar.-78
Haight, E. G. ....	Oct.-82
Haines, John E. ....	Sept.-72
Hess, A. E. ....	Apr.-92
Hood, F. J. ....	June-86
Johnston, John P. ....	Mar.-76
Jones, Austin .....	May-72
Keely, L. C. ....	Feb.-72
King, James .....	Jan.-68
Kingsland, Martyn .....	Dec.-78
Kipp, Roger P. ....	Oct.-80
Kirk, Frank D. ....	Aug.-86
Kyle, E. S. ....	Aug.-82
Lesley, P. Fred .....	May-76

#### PORTRAITS Continued:

Linehan, Lester D. ....	Sept.-70
Lockwood, Charles B. ....	Oct.-80
Logan, Charles R. ....	May-70
Malcolm, H. A. ....	Dec.-80
Marshall, William .....	Apr.-54
Matheson, W. A. ....	Nov.-21
McDougall, Ben M. ....	Mar.-76
McDougall, Franklin M. ....	Oct.-80
Merkle, J. D. ....	Aug.-88
Miller, Marion E. ....	May-74
Moore, Joe .....	May-72
Morgan, Robert W. ....	Sept.-74
Norris, J. A. ....	Aug.-84
Olin, Carl L. ....	Apr.-47
Palmer, Carl J. ....	Aug.-68
Patterson, H. C. ....	May-74
Pedder, J. E. ....	Mar.-78
Plesskott, E. A. ....	Feb.-52
Reed, Paul B. ....	May-52
Robertson, R. C. ....	Sept.-74
Russell, Charles P., The Late.....	Sept.-74
Sagar, Paul B. ....	Jan.-68
Sanders, G. O. ....	Aug.-82
Schenk, John A. ....	Mar.-74
Schlemmer, J. M. ....	Dec.-80
Schroeder, Carl .....	Feb.-68
Seibert, E. A. ....	Aug.-23
Sellers, S. R. ....	May-74
Siegfried, W. A. ....	May-70
Smith, E. M. ....	Aug.-82
Sneath, William .....	Apr.-54
Sommer, E. H. ....	Oct.-23
Sprout, P. V. ....	Sept.-21
Sullivan, Alfred D. ....	June-90
Swaton, J. A. ....	Aug.-84
Van Scoyk, Howard E. ....	June-88
Whipps, C. E. ....	Sept.-76
Whitmore, H. W. ....	Nov.-90
Wilson, Irving A. ....	Feb.-74
Wilson, J. W. ....	Feb.-68

R	
Rebuilding Commercial Job.....	Jan.-32
Refrigerated Cargo Carrier.....	May-37
Refrigerating Unit for Ice Water in South Pacific .....	May-31
Refrigeration Charging Line and Fittings.....	Oct.-62
Refrigeration Shop, Cebu.....	June-64
Refrigerator Demonstration Boards.....	Apr.-46
Refrigerators, New 1946.....	Dec.-23
Roller Bar .....	Jan.-30
Ruthenburg Guest Speaker on Radio.....	May-70

S	
San Francisco Bay Area Men.....	Feb.-46
Jobs .....	May-68
Seal Repairing Clamp.....	Aug.-44
Servel Supermatic Unit.....	July-32
Cross-Section .....	July-31
Service Shop, Rebuilding Hermetic Units.....	Sept.-24
Valve for Ward Unit.....	Mar.-37
Sign for Captain Storrs.....	Sept.-50
Spring Handling Tool.....	Jan.-31
Springfield Chapter Dedicates Service Flag.....	July-66
Stein, Charles .....	Nov.-44

T	
Tag, Visoleak .....	June-84
Tenite Plastic Case .....	Apr.-84
Tenney Valve .....	Nov.-70
Testing Device, Capacitor Motor.....	Mar.-38
Transmission for Remote Circuits.....	Sept.-36
Trolley, First Air Conditioned.....	Nov.-32

U	
United Commercial Sales Store, Los Angeles .....	Apr.-39
Universal Cooler Corp. Executive Conference .....	Feb.-74
Utilities Engineering Institute Adds Deep Freeze .....	Sept.-70

W	
Westinghouse Conserve Schools.....	Apr.-46
Film .....	May-46



## Advertisers Index

Acme Control Service.....	77
Aerovox Corp.....	77
Airco Refrigeration Parts.....	87
Airo Supply Co.....	83
Alco Valve Co.....	5
Alter Co., The Harry.....	75 and 85
Anderson, John.....	79
Ansul Chemical Co.....	1
Auto-Diesel Piston Ring Co., The.....	87
Automatic Heating & Cooling Supply Co.....	83
Automatic Products Co.....	48 and 49
Blythe Co., H. W.....	79
Bonney Forge & Tool Works.....	Back Cover
Borden Co., A. E.....	84
Brunner Mfg. Co.....	12
Boston Technical Institute.....	86
Chase Refrigeration Supply Co.....	84
Chicago Seal Co.....	Inside Front Cover
Chicago-Wilcox Manufacturing Co.....	86
Commercial Trades Institute.....	81
Davison Chemical Corp.....	Inside Back Cover
Day & Night Mfg. Co. (Cooler Div.).....	75
Detroit Lubricator Co.....	2 and 3
Dole Refrigerating Co.....	73
Du Pont de Nemours & Co., E. I. (Electrochemicals Dept.).....	8 and 9
Edison Cooling Corp.....	85
Electrimatic.....	71
Flow Controls, Inc.....	87
G & E Equipment Supply Co.....	85
General Controls.....	59
Grancell, I. H.....	86
Hasco, Inc.....	85
Henry Valve Co.....	4
Highside Chemicals Co.....	22
Imperial Brass Mfg. Co.....	7
Jarrow Products.....	81
Joliet Chemicals, Ltd.....	63
Justrite Mfg. Co.....	82
Kelvinator (Div. of Nash-Kelvinator Corp.).....	20
Kerotest Mfg. Co.....	67
Keystone Engineering Corp.....	96
Kinetic Chemicals, Inc.....	53
Kold-Hold Manufacturing Co.....	55
Kramer Co., Fred C.....	79
Kramer-Trenton Co.....	61
Lynch Mfg. Corp.....	14
Mills Industries, Inc.....	69
Minerallac Electric Corp.....	82
Minneapolis-Honeywell Regulator Co.....	13
McIntire Connector Co.....	17
Modern Gas Co., Inc.....	71
Mueller Brass Co.....	57
New Duty.....	87
Nobs Chemical Co.....	84
Peerless of America, Inc.....	11
Ranco, Inc.....	18
Refrigeration Control Service.....	84
Refrigeration Maintenance Corp.....	73
Refrigeration Service, Inc.....	87
Sanitary Refrigerator Co.....	79
Servel, Inc.....	83
Service Parts Co.....	86
Skasol Corp.....	65
Stangard Dickerson Corp.....	81
Superior Valve & Fittings Co.....	15
Temprite Products Corp.....	10
Tedward Co., The.....	81
Thermal Co., Inc.....	83
United Speedometer Repair Co.....	86
Utilities Engineering Institute.....	88
Utility Thermostat Co.....	84
Virginia Smelting Co.....	6
Western Thermal Equipment Corp.....	77
White Rodgers Electric Co.....	16
Wilson Refrigeration, Inc.....	85

## Classified Ads

Rate: Two Dollars for fifty words or less,  
30 cents for each additional ten words or less.

**FOR SALE**—Remanufactured air and water-cooled condensing units.  $\frac{3}{4}$  h.p. up to  $1\frac{1}{4}$  h.p. Frosted food & ice cream cabinets. Edison Cooling Corp. 310 East 149th St., New York 51, N.Y.

**INCOME TAX PAYERS**—You can save by being prepared. Get our Copyrighted Income Tax Record. No books to read. Easy to understand. Schedules and how to figure include Business, Rental Property, Rental Property partly occupied by Owner, Medical, Car and Truck, use of part of your residence for business and other vital information. Price \$1.00. Berman, Box 335, Worcester 1, Mass.

**COMMERCIAL APPLICATION & SERVICE ENGINEERS**—Large refrigeration firm with growing export business has openings in several territories for qualified refrigeration application and service engineers. Knowledge foreign languages helpful. Write giving full details, experience and references. Address Box SP-2, The Refrigeration Service Engineer, 435 N. Waller Ave., Chicago 44, Ill.

**POSITION WANTED**—All around service man wants refrigeration work anywhere in the States. Am capable in any type of work. Many years experience on all types of equipment. At present doing service work on Navy ships at Pearl Harbor. Would prefer factory field service. Have family in mid-west. Would consider foreign field if proposition good enough. Can do any type of copper construction. Address Box DC-1, The Refrigeration Service Engineer, 433 N. Waller Ave., Chicago 44, Ill.

## SET IT and FORGET IT PRESSURE—TEMPERATURE CHART

For all types of commercial installations

**SAVES SERVICE TIME**

Send one dollar to

**PAUL F. MILLER**

Nazareth

R. D. No. 3

Penna.

**If you have equipment to sell,  
use R.S.E. WANT ADS for quick  
action.**

## SERVICE MEN— ADDED PROFITS ARE POSSIBLE

Eliminate the lost time from service calls by using our repair service on compressors. We specialize in prompt efficient workmanship on your compressor repairs. 90 day guarantee—Reasonable prices.

We do not repair Hermetic units.

Write for quotations to

**Keystone Engineering Corp.**

844 Keystone Ave., Chicago 51, Ill.

Phone: BELmont 5635



# DAVISON'S SILICA GEL



**goes further...does more**

Davison's Silica Gel was developed under close collaboration with refrigeration engineers who knew only too well the shortcomings of ordinary drying agents...Recognized as a basic contribution to the refrigeration industry, Davison's Silica Gel ends moisture troubles and other danger-creating elements that stop most drying agents.

1—It is processed especially for the dehydration of refrigerants . . . 2—Its scientifically-determined particle size assures you that the refrigerant will not channel—will be distributed evenly throughout the cartridge . . . 3—This even distribution of the refrigerant makes it possible for it to

be in complete contact with the entire pore-surface area at all times . . . 4—It removes acids . . . corrosive compounds and other impurities . . . in addition to moisture . . . instantly . . . 5—Its capacity for moisture is not affected by oil . . . 6—It will not cake or powder . . . 7—It will not attack metals or alloys . . . 8—Complies with the requirements of joint Army-Navy Specification JAN-D-169-Grade A Type II for Desiccants (activated).

Get the complete drying agent that is effective on Freon, Methyl Chloride, Sulphur Dioxide, etc.; specify Davison's Silica Gel from your jobber—in factory-charged dehydrators or in bulk for refill.

THE DAVISON CHEMICAL CORPORATION  
*Progress through Chemistry* **D** BALTIMORE-3, MD.

Canadian exclusive sales agents for DAVISON'S SILICA GEL:

CANADIAN INDUSTRIES LIMITED. General Chemicals Division

# BONNEY *"Versatile"* SOCKETS

• Over 1000 combinations! Five drive sizes from  $\frac{1}{4}$ " to 1"  
With Bonney Sockets you can handle any nut-turning job in  
the books. And do it faster, better and easier too! Easy to attach  
and detach, each Bonney socket and attachment is designed,  
machined and heat treated to exacting specifications. For the  
easiest-working, longest-lasting socket wrenches, see your  
nearby Bonney distributor or jobber.



**BONNEY FORGE & TOOL WORKS**

717 N. MEADOW ST., ALLENTOWN, PA.

In Canada: Gray-Bonney Tool Company, Ltd., St. Clarens & Royce Aves., Toronto

BUY VICTORY BONDS AND KEEP THEM

LEY  
E  
ORKS  
rente